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June 29, 1936

STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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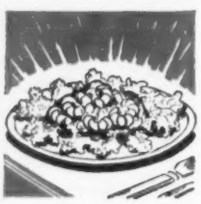

THE METAL SHRIMPS LOVE TO TOUCH

Shrimps are sensitive little creatures—so sensitive that they turn black when in contact with some metals—but not with ENDURO Stainless Steel. That's why shrimp fishermen on the Gulf Coast are ordering and using perforated shrimp baskets of ENDURO.

PUT - PUT - PUT . . . BECOMES PUR-R-R-R-R

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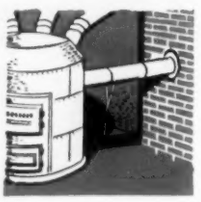
The old seasonal worry and expense of changing rusted-out furnace smoke pipe can now be banished—merely by having smoke pipe of ENDURO Stainless Steel installed. ENDURO is immune to oxidation at high temperatures and is resistant to corrosion.



NOW—YOU CAN ORDER BOILED EGGS A LA ENDURO

When a well-known manufacturer of egg boilers—in which electric current passes through water without use of heating coils—discovered that lime deposits on certain metals impaired efficiency, they changed to ENDURO and eliminated difficulties.

"DID I EVER TELL YOU ABOUT MY OPERATION?"

With these words, many a bridge game has been disrupted. Don't blame the disruption on ENDURO Stainless Steel, but give it credit for assisting the surgeon. The instrument that held the incision open, and many others, too, probably were made of ENDURO.

WHERE WEIGHT IS WORTH MONEY

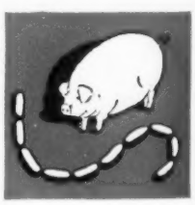
Each pound of weight reduced in airplane service means added capacity for payload. ENDURO has aided in many ways. For instance, in drinking water tanks, where ordinary metals present corrosion troubles, stainless not only protects the water but reduces weight.

ENDURO STAINLESS STEEL GOES TO PRISON

Not because it committed a crime—but because it takes such a high, even polish that it is ideal for mirrors in prison medicine cabinets. Furthermore, it is exceptionally strong and cannot be broken and used as a dangerous weapon. It lasts indefinitely.

THIS LITTLE PIG WENT TO MARKET—VIA ENDURO

He didn't know it, but the minute he became so many pounds of pork and from then on until he became sausage, he traveled over tables, through machinery, through tanks — all made of ENDURO Stainless Steel — the metal that safeguards meat products.



For beauty, sanitation, corrosion-resistance, or heat-resistance—with high strength and long life—no matter what you make—consider ENDURO *Stainless Steel, trail blazer to better products and bigger profits. Write for full information.*

Republic Steel CORPORATION

REPUBLIC STEEL

GENERAL OFFICES · · · CLEVELAND, OHIO
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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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MOLY for WEAR

WHENEVER a product is faced with stiff operating requirements, price is not the final measure of its value or economy. "How well will it wear? How long will it last?" Its answers are the real sales-closing factors.

A manufacturer of fuel-oil pumps found that out. His competitive success, he discovered, depended on the steel he selected for rotors. It had to have exceptional hardness to resist wear and to combat the corrosive effects of various types of fuel oils.

A Chrome-Moly (SAE 4130) cyanided rotor was the solution. Not only was it found to take an extremely hard case, but it involved less hardening and machining costs. Thus, while searching for one advantage, two were found, viz., higher quality and lower production cost.

Your problems may be simpler. Or they may be even more complicated. In either case, it will pay you to investigate Moly steels. Their almost limitless range of applications is envisioned in our technical book, "Molybdenum." We invite engineers and production heads to write for it. Also ask to be placed on the mailing list of our periodical news-sheet, "The Moly Matrix." And — if you've a peculiar alloy problem needing further study, our experimental laboratory facilities are at your command. Climax Molybdenum Company, 500 Fifth Ave., New York City.

CUTS COSTS CREATES SALES

CLIMAX Mo-lyb-den-um MOLY

As the Editor Views the News

FOUR reiterated sentences in the Democratic platform point significantly to the course the present federal administration will pursue if it is returned to office for the next term. According to these four statements, the farmer, worker, business man and youth "have been returned to the road to freedom and prosperity." And in each case the platform pledge is, "We will keep them on that road." If these pledges mean anything, they mean that President Roosevelt stands on his past record unequivocally and cocksurely and that he will continue his policies unchanged. There is nothing to indicate that the persecution of business will cease.

• • •

Just Leave It to Uncle Sam

A striking feature of the platform is the casual manner in which it is assumed that the government is capable of knowing what is best for the farmer, worker, business man or ordinary citizen. The individual is not credited with enough intelligence, vision, or initiative to know what he wants or needs. He is not supposed to worry, or even to care about his own problems. All he is expected to do is to trust himself to the mercy of his government. It knows all, sees all and will provide for everything. This false note of paternalism will not wear well with the American people.

• • •

Dramatizing Iron, Steel

Saturday the public began streaming through the gates of the Great Lakes exposition in Cleveland. Visitors to this lakeside exhibition are quick to realize that its motif (p. 18) is the romance of iron and steel. They are shown, by means of unusual dramatic effects, the extent to which the convenient meeting of ore and fuel has shaped the destiny of that great industrial area which lies within the crescent formed by the eight states bordering upon the Great Lakes. Industry has an important stake in the show in that it is making an elaborate attempt (p. 33) to acquaint the layman with the principal processes of production and manufacture. Such educational efforts are valuable, particularly to the iron, steel and metalworking industries, which today need the sympathetic understanding of the man in the street.

• • •

Planning for Redesign

To change a product to conform to new requirements in sales or service presents numerous difficulties. Sometimes the activities attending the process of redesign can be handled gradually or progressively, but in the case of certain products it is necessary to effect the change-over at one time. This usually involves careful planning in many departments. A good illustration of such planning is afforded by the experience of the Westinghouse Electric & Mfg. Co. in redesigning an air conditioning condensing unit (p. 36) and in placing it in production in its East Springfield, Mass., works. Manufacturers will be interested in the numerous factors considered in this work and especially in the measures taken to insure economy of production and quality of product.

• • •

Record at Half Is Impressive

The approaching end of June provides an appropriate datum point for checking the business record of the first half. STEEL's index of industrial activity for the current six months (p. 34) shows a gain of 15.3 per cent over comparable figures for 1935. This increase is comfortably ahead of the 10 per cent rise freely predicted by the forecasters at the beginning of 1936. A breakdown of the factors in the improvement shows that the durable or capital goods industries have led the procession. Railroad car awards, and orders for machine tools and foundry equipment have fared better than the demand for consumer goods. The Garrison finish in June has lifted the second quarter to the distinction of being the best three-month period since 1929.

E. L. Shaner

Steel's Supremacy, a Keynote At Great Lakes Exposition

DEDICATED to the industries of eight Great Lakes states—Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Pennsylvania and New York—and signalizing the 100th anniversary of the incorporation of the city of Cleveland, the Great Lakes exposition opened June 27.

Underwritten to an extent of over $1,000,000 by industries in the Cleveland area, a central theme of the exposition has been designated as the Romance of Iron and Steel.

Importance of the Great Lakes states from an industrial standpoint may be indicated by a few figures. Here is mined annually 85 per cent of the iron ore originating in the United States, or one-third the world's output; also 177,000,000 tons of coal. In 1934, about 60 per cent of all new construction in the country was concentrated in the Great Lakes states. One-half the total production of electric power for the country is used in these states.

Estimates give these states credit for 54.3 per cent of the nation's manufactured goods, 55 per cent of the country's wholesale business, 56 per cent of the retail business and 52 per cent of all manufacturing establishments in the country.

Depicts Iron, Steel Making

From an industrial standpoint, greatest interest in the exposition centers in a large underground exhibition hall where a central towering exhibit of various steps in the mining of ore and making of iron and steel are depicted, the 228 x 541-foot automotive building which houses exhibits of automobile builders and automotive parts producers, the 180 x 540-foot hall of progress in which are located displays of public utility interests, federal government and others; and a 30 x 100-foot building finished in porcelain enameled sheets and housing exhibits sponsored by a number of enameling companies, sheet steel producers and others.

The Romance of Iron and Steel exhibit was sponsored by a number of leading steel producers, and according to its director, Dr. A. A. Bates, associate professor of metallurgy, Case School of Applied Science, Cleveland, represents "the most elaborate attempt ever made to convey to the layman a factual presentation of the essential steps involved in the production of iron and steel, from ore mine to finished product."

Entering through a portal which appears to have been carved in a hillside typical of the Minnesota iron ore ranges, the visitor finds himself in a full-size mine shaft. Inside are tracks and switches for cars which are loaded with ore, the reddish glow of which is reflected from walls, ceiling and floor. To one side of the tunnel opens a large mine room in which life-size figures appear to be at work in removing the ore. Further along a large relief map of the Great Lakes region depicts iron, steel and coal commerce of the lakes district. Large colored photomurals show various scenes in loading and unloading iron ore.

Against another hillside further on is an ancient forge with bellows, a beehive charcoal oven and a stone blast furnace of the type used over a century ago—all full size. Other large and brilliantly illuminated photomurals portray the various processes involved in steelmaking, including the old-fashioned puddling process, the bessemer converter, electric furnace, open hearth, coke ovens, etc.

In the largest section of the display is a full-size reproduction of the cast house of a blast furnace. Lights in the interior of the furnace give the impression of an actual furnace in operation. Replica of a 125-ton pouring ladle, glowing and fuming at the top, has a door at the base through which visitors may walk and inspect a series of photographs on the interior picturing the complete open-hearth process. Nearby are working models of a blooming mill and a continuous hot strip mill. Miniature sheets supplied by this mill, 1/32-inch thick are stamped in a small automatic press into model automobile parts. Other models are an automatic wire drawing block, a galvanizing plant, and a butt welded tube mill.

Myron S. Curtis, sales promotion manager, Youngstown Sheet & Tube Co., Youngstown, O., and James T. Dickson, co-ordinator of exhibits for the exposition, assisted Dr. Bates in developing this interesting and instructive display, which occupies a space of 100 x 200 feet.

Allied Industries Represented

Flanking this central exhibit are displays of a number of companies allied with the iron and steel and metals field. These include:

American Rolling Mill Co., Middletown, O.; American Shipbuilding Co., Cleveland; Arco Co., Cleveland; American Brake Shoe & Foundry Co., New York; Bettcher Stamping & Mfg. Co., Cleveland; Chase Brass & Copper Co., Waterbury, Conn.; Cleveland Co-operative Stove Co., Cleveland; Cleveland-Cliffs Iron Co., Cleveland; Forest City Foundries Co., Cleveland; Grasselli Chemical Co., Cleveland; Great Lakes Steel Corp., Detroit; Hanna Coal Co., Cleveland; Harris Seybold Potter Co., Cleveland; E. F. Hauserman Co., Cleveland;

MORE than 75 exhibitions, of the hundreds in the Great Lakes exposition, Cleveland, are sponsored by producers of iron ore, pig iron, steel, or manufacturers of fabricated steel and other related products. They have co-operated to make this a great show for steel. Streets, like this, are gorgeously illuminated

AN IRON ore mine in the Great Lakes exposition's industrial hall. Iron ore outcroppings on a hillside, showing the formation of the ore body, are faithfully reproduced; and the visitors enter the mine through a portal in the hill. Here they see real miners at work with real iron ore, and how the ore is removed. Other features of this general exposition are large models of old-time forges, where iron may be produced from the ore; base of a modern blast furnace, model rolling mills; color photographic murals, large as billboards, depicting the manufacture of steel

Henry Furnace & Foundry Co., Cleveland.

Interlake Iron Corp., Chicago; International Business Machines Inc., New York; International Nickel Co., New York; Lake Superior Iron Ore association, Cleveland; Mills Co., Cleveland; National Steel Corp., Pittsburgh; National Cash Register Co., Dayton, O.; Osborn Mfg. Co., Cleveland; Perfection Stove Co., Cleveland; Otis Elevator Co., New York; Republic Steel Corp., Cleveland; John A. Roebling's Sons Co., Trenton, N. J.; Safety Clothing Co., Cleveland; Standard Tool Co., Cleveland; Superior Die Casting Co., Cleveland; Timken Roller Bearing Co., Canton, O.; W. S. Tyler Co., Cleveland; United States Steel Corp., New York; and Youngstown Sheet & Tube Co.

The underground exhibition hall is connected with the main section of the exposition on the lakefront by a steel-frame bridge 100 feet wide and 350 feet in length, which required about 250 tons of steel in its construction.

General Electric Co. and Westinghouse Electric & Mfg. Co. engineers co-operated in perfecting new forms and intensities of lighting. For instance, mounted on a lagoon theater at the lakefront are eight 36-inch arc searchlights of 414,000,000 candlepower each which radiate powerful beams of light in changing colors, resembling an aurora borealis. Trough lighting throughout all buildings and decorative structures is arranged in different colors so that the entire exposition at night is a kaleidoscope of color, without being annoying to the eye.

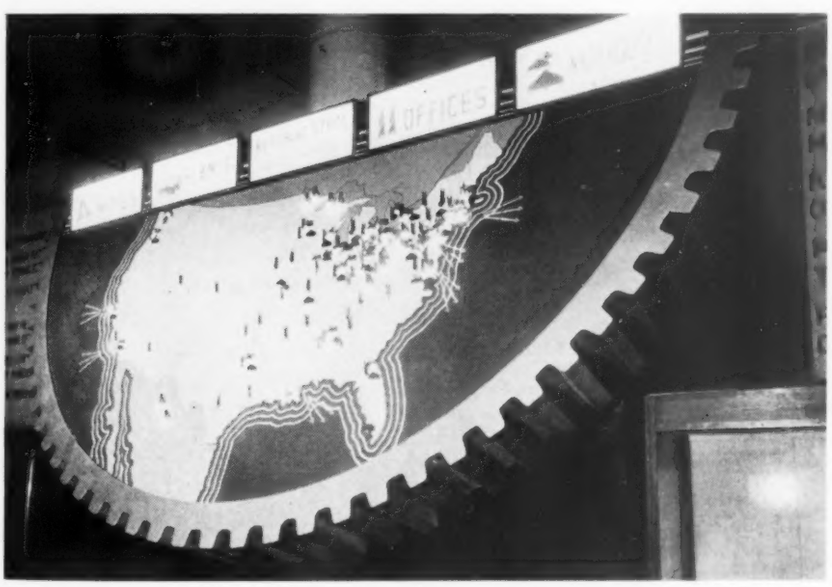
The automotive building is constructed with scissor trusses forming two long gable-roofed structures with an interior landscaped court. Thirty-two 70-foot pylons at the entrances are surmounted by 30-foot steel flagpoles. The steel scissor trusses are built up of angle sections, and are placed 20 feet apart, giving a continuous and unobstructed view of the interior of the building.

Exhibitors include:

Ford Motor Co., General Motors Corp., Chrysler Corp. and White Motor Co. of the auto producers, as well as Briggs Mfg. Co., Detroit; Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh; Cleveland Graphite Bronze Co., Cleveland; Frigidaire Corp., Dayton, O.; Leece Neville Co., Cleveland; Mullins Mfg. Co., Salem, O.; Pennzoil Corp., Cleveland; Socony-Vacuum Oil Co., New York; Standard Oil Co. of Ohio; Thompson Products Inc., Cleveland; Willard Storage Battery Co., Cleveland, and Winton Engine Mfg. Co., Cleveland.

The hall of progress represents an interesting departure in building construction, involving the use of a light truss work of 2 x 6-inch and 2 x 10-inch members covered with five-ply ⅝-inch plywood. The latter becomes a functional part of the truss members—both leg and top members. Two 30-foot spans complete a 60-foot rigid frame. Exterior leg mem-

(*Please turn to Page 23*)



PLANTS, mines, warehouses and sales offices of Republic Steel Corp. are represented by miniature silhouette symbols of stainless steel on this huge map, painted on the face of a replica of 24-foot gear which dominates the company's exhibit at the Great Lakes exposition, Cleveland. Iron and coal mines in six states, 39 plants in 27 manufacturing centers, 30 warehouses and 28 sales offices are marked by individual lights in colors which give a picture of the company's production and distribution facilities

Broad, Consistent Rise in Steel Marks First Half, 1936

RECOVERY in more convincing measure came to the steel industry in the half-year just closed.

Few consuming industries basic to its welfare failed to show a striking degree of improvement.

Notwithstanding that introduction of new automobile models last fall concentrated in that period a substantial portion of the steel requirements, which normally would have gone further to swell the rising tide of demand in the early months this year, steelworks operations have maintained an average of 62.6 per cent, 17 to 22 points above the profit line. By comparison, the average in the first six months last year was 47.1 per cent.

From a continuation of the strong automobile market, from the railroads, the farms; from structural work, heavy equipment industries; machine tools, as well as from the household equipment fabricators; container manufacturers and miscellaneous sources, far exceeding expectations, this support has swept steel into its best position since the first half of 1930.

In most products, the record of the first half of 1930 was almost equaled. First half of 1935 was excelled by 21 to 38 per cent. In freight car awards 1936 rolled up a sales total four times that of the comparable period of 1935.

Pig iron and steel ingot output in the past six months exceeded production in the entire year of 1932, the low of the depression. Production in the first half of 1936, with June estimated, was 13,683,784 gross tons, compared with 9,829,934 tons in the first half of 1935, a gain of 38 per cent. First half of 1930 produced 18,304,614 tons; all 1932, 8,674,067 tons and all 1933, 13,221,707 tons.

Steel ingot output records a 33 per cent gain over first half of 1935. With June estimated, the total is 21,387,743 gross tons, compared with 16,042,651 tons in the first half 1935. The ingot output was close to that of the first half 1930—23,578,619 tons. It far exceeded ingot output for all of 1932, which was 13,322,833 tons.

In Lake Superior iron ore, total estimated shipments to July 1 this year—11,000,000 tons—represent a 37 per cent increase over 8,145,000 tons in the comparable period in 1935.

Probably the most striking rise in buying is shown in freight cars. Awards in the six months just closed numbered approximately 28,079 including 2970 placed by Southern Pacific at the close of June. In the first six months of 1935 only 6333 cars were ordered.

This year's gain in freight cars account for about 200,000 tons more steel than requirements in the first half of 1935. Awards in all 1934 numbered 23,829 and in all 1933 the total was 2460.

Automobile production showed a less spectacular advance. Total for the first half, June estimated, was 2,469,007, compared with 2,218,255 in the first half of 1935. In the first six months of the new models, beginning with October, 1935, output totaled 2,144,211. The automobile industry showed spectacular recovery last year, making 3,946,934 cars, compared with 2,733,111 in 1934. The feature of the steel market so far as it relates to automobiles this year has been a continuation of the strong demand first experienced last year plus moderate improvement.

The gain in structural shape awards—33 per cent—was close to that in steel ingots. STEEL's compilations for six months show 517,009 tons in identified projects of over 100 tons each. This compared with 387,266 tons for the same period of 1935.

In reinforcing steel, STEEL's compilations, 152,034 tons, compare with 125,414 tons in first half 1935, a gain of 21 per cent.

Steel rails for rolling in the first half of 1936 totaled 466,300 gross tons, compared with 263,301 tons in 1935, an increase of 77 per cent.

Further evidence of the broad improvement is noted in the record of shipments of finished steel by the United States Steel Corp. With June estimated at about the totals of April and May, shipments were close to 5,145,285 tons, a gain of 44 per cent over the 3,553,999 tons shipped in the first six months of 1935.

Exports showed little change. In the first half of 1936, a total of about 1,321,690 gross tons of iron and steel products were shipped abroad, compared with 1,306,353 tons in first half of 1935.

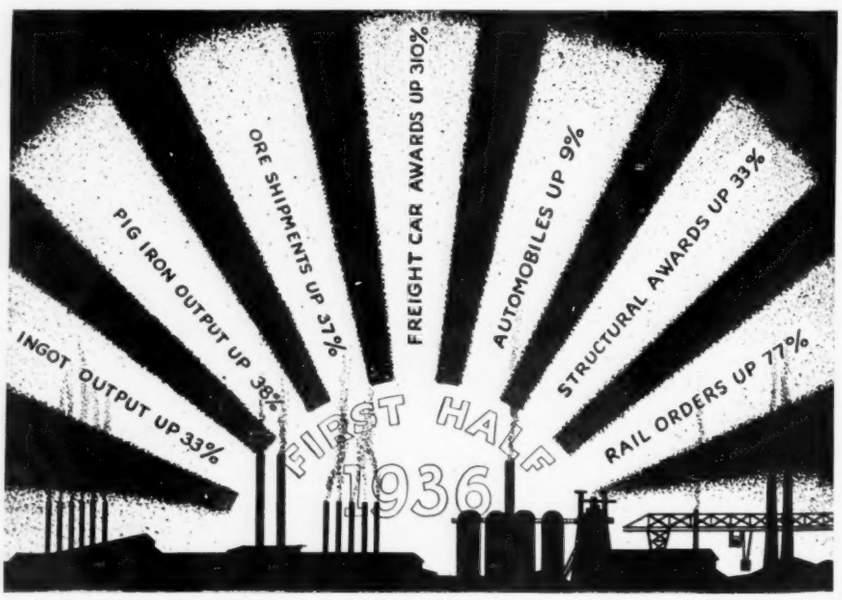
Steel Employment Highest Since September, 1930

During May, employment in steelworks, rolling mills and blast furnaces reached the highest level since September, 1930, according to government labor reports released last week. So far in June steelworks operations have held close to the May average.

The bureau of labor statistics' index of employment in all industries rose from 85.1 in April to 85.6 in May, while the payroll index advanced from 77.9 in April to 79.2 in May. In May, 1935, the two indices were 81.2 and 68.5 respectively. The gain in May marked the third consecutive monthly rise and was contraseasonal.

Foundries and machine shops em-

Steel Stages a Recovery Exhibition of Its Own



ployed more workers than in any month since September, 1930.

More than 650,000 workers were re-employed from May, 1935, to May, 1936, in the industries surveyed. A gain of nearly $36,000,000 was shown in earnings. Factory employment increased 6/10 of 1 per cent as a result of the return of more than 43,000 workers.

New Capacity

UNITED STATES STEEL CORP. will begin work immediately on construction of a 5-stand, in tandem, cold rolled reduction mill at the Gary, Ind., works of its subsidiary, Carnegie-Illinois Steel Corp. The $5,500,000 appropriation for this mill is in addition to the $40,000,000 previously authorized for construction at Gary.

CRUCIBLE MILL NEARLY READY

Pittsburgh Crucible Steel Co., Midland, Pa., will begin manufacturing tin plate early in the fall. This is in conjunction with its $1,000,000 expansion program previously announced and now under way. The company will start with strip steel which will be rolled down to tin plate gages on a cold reversing mill.

Electric Refrigerator Sales Up 25 Per Cent

Domestic sales of household electrical refrigerators in the first four months this year totaled 796,294, compared with 636,405 in the first four months of 1935, and 449,889 in 1934. This current report from the refrigeration division of the National Electrical Manufacturers association indicates that the sales this year have been approximately 25 per cent larger than in 1935. Values of the domestic units this year were $65,280,881, approximately 31 per cent higher than those in 1935. In 1934, for the same period, the values were $38,524,753.

Not only have the domestic sales shown a substantial gain, but in Canada and other foreign countries there has been remarkable improvement. In the first four months this year the unit sales throughout the world amounted to 854,903, with a value of $69,519,281. In 1935 the number was 674,978 and the value $52,582,930; and in 1934, 477,115 and value $41,016,633.

Reports indicate a similar gain for commercial refrigerating machines. Of these, 27,299 units were sold to distributing outlets in April, the greatest volume of commercial machine sales ever reported for one month.

"Government With Us!" Cry Steel Labor Organizers

THAT old cry of the leaders of organized labor—"the governn ent is with us!"—was raised again, and more vociferously, as efforts to unionize the steel industry last week gained momentum.

While John L. Lewis, William Green and other labor leaders were giving whole-hearted indorsement to the Democratic platform, the Amalgamated-Lewis organizers in the field were dinning into the ears of steel plant labor—"the government is with us!"

Steel plant labor is being bombarded with propaganda in efforts to drive a wedge between employe representative groups, and employers.

By means of meetings, picnics, personal solicitation near the steelworks, occasional flare-ups, and a vast amount of publicity, the CIO is creating a semblance of great activity and strength, though the movement so far apparently has not yet reached a point where the CIO has cared to make an actual test of that strength.

Has Communistic Accent

The CIO strategy is not confined to the steel plants. Renewed pressure is being brought to bear on Washington. At the Democratic convention last week said Lewis: "Labor can indorse the platform with faith and confidence in the future." And at the communists' national convention in New York delegates were told "Company unions in the steel industry are being undermined."

The movement in spots has a distinctly communistic accent, as did the labor drive in 1918, led by William Z. Foster.

According to steel company spokesmen, relatively few employe representatives have gone over to the CIO.

Reports that the employe representatives in the Chicago district are planning a convention in Cleveland shortly, in an effort to win over to the trade union movement those who have been loyal to the employe plan, apparently were instigated by the CIO and its friends.

PITTSBURGH—The steel workers' organizing committee moved in on the entire thirty-sixth floor of the Grant building, Pittsburgh, last week, making this its eastern headquarters. From here the campaign will be directed in all states east of Ohio, including New England but excepting Buffalo and other Great Lakes ports. Fifteen additional organizers were assigned posts.

A delegation of United States Steel Corp. executives, including Arthur H. Young, vice president in charge of personnel and industrial relations, conferred here on the labor problem with Carnegie-Illinois Steel Corp. executives. No statement was made after the meeting.

CHICAGO—Outside union organizers have appeared in the Chicago district and have commenced on their announced program of organizing steel plant workers. So far nothing of note has been accomplished since activities are just getting under way. Mass meetings, similar to several conducted at eastern plants, are expected to be held in the Chicago area where offices of the steelworkers' organizing committee are being opened. No disturbances or demonstrations at the plants have been reported.

PORTSMOUTH, O.—About 75 strikers and sympathizers last week engaged a dozen Wheeling Steel Corp. company guards in a gun fight in which 200 to 300 shots were fired. The plant has been closed by a strike since May 22. Shooting began when an attempt was made to move food into the plant in a company locomotive. A company guard was killed and four other persons wounded.

BIRMINGHAM, ALA. — The campaign to unionize steelworkers in the South is under way. William Mitch, president, of Alabama district No. 20, United Mine Workers of America, and president of the Alabama Federation of Labor, is in charge. At Gadsden, the city commission, chamber of commerce, and civic clubs have declared that all labor desiring to continue at work will be fully protected.

BALTIMORE—Work was resumed last Thursday at all plants of the Eastern Rolling Mill Co., after A. J. Hazlett, president, announced an amicable settlement of labor difficulties.

Sheet, Tin Plate Workers Given 2% Wage Raise

A 2 per cent increase in tonnage wage rates is embodied in an agreement to go into effect July 1 between the Western Association of Sheet & Tin Plate Manufacturers and the Amalgamated Association of Iron, Steel & Tin Workers. The union asked for a 15 per cent increase.

Production

STEELMAKING was raised 1 point last week to 71½ per cent, highest since the third week in May, 1930. Higher ingot output at Youngstown, eastern Pennsylvania, Cleveland, Birmingham and Cincinnati more than offset slight declines at Pittsburgh and New England. Further details follow:

Youngstown—Up 2 points to 80 per cent last week, with a sharp decline to 76 per cent expected at this week's opening. Operations a year ago were at 32 per cent.

Detroit—Unchanged at 100 per cent last week. One producer continues with all eight open-hearth furnaces in operation, and the other has all nine units in production. The latter also continues to operate its large 400-ton mixer.

Wheeling—Unchanged at 71 per cent last week, with 26 open-hearth furnaces out of 37 in the district melting.

Pittsburgh—Off 1 point to 66 per cent last week, the decline being caused largely by a slight curtailment in ingot rates of the United States Steel Corp. subsidiaries, which were operated at 58 per cent last week. Jones & Laughlin operated at 68 per cent, and the rates of other independents averaged 65-70 per cent. Finishing mill schedules were unchanged. Tin plate departments were at 100 per cent, sheets at 70 per cent, but strip was off fractionally to 58-60 per cent, although pipe advanced to 50-55 per cent. Thirty-six out of 60 steelworks blast furnaces continue active.

Chicago—Continued at 71 per cent, with prospects favorable for a maintenance of operations at around this level through a large part of July. Some mills have been forced to rearrange rolling mill schedules to accommodate their limited supply of semifinished steel. Blast furnace schedules are steady, with 24 of 41 stacks active. A Federal furnace of Interlake Iron Corp. will be blown in July 1, the first production at this plant in more than a year and a half.

Buffalo—Continued at 84 per cent last week, and will maintain this rate until the end of this week. There is strong pressure for immediate delivery of many materials and no sign of a slackening in demand for any of the major items of the list.

Central eastern seaboard—Advanced 1½ points to 47 per cent, the highest level in many months. A slight curtailment may come this week as a result of the July 4 holiday, but the outlook for the next few weeks is promising, with no marked letdown expected throughout the greater part of July.

New England—Down 3 points to 80 per cent, with an increase of 7 points scheduled for this week.

Birmingham—Gained 4 points last week to 58½ per cent. Demand for steel is strong and this may result in additional open hearths being put on.

Colorado—Unchanged at 50 per cent last week, with eight open hearths melting.

Cincinnati—Up 4 points to 80 per cent, with addition of one open hearth replacing one taken off recently by another branch of the same company. The production level will be lower July 1 or shortly thereafter, but schedules have not been announced.

Cleveland-Lorain—Gained 2½ points last week to 84½ per cent last week, with Corrigan-McKinney operating 13 out of 14 open hearths, Otis Steel Co. all 8, and National Tube Co. at Lorain all 12.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended June 27	Change	Same week 1935	Same week 1934
Pittsburgh	66	— 1	30	40
Chicago	71	None	41	51
Eastern Pa.	47	+ 1½	29	36
Youngstown	80	+ 2	42	44
Wheeling	71	None	48	62
Cleveland	84½	+ 2½	46	64
Buffalo	84	None	32	24
Birmingham	58½	+ 4	30	55
New England	80	— 3	61	65
Detroit	100	None	94	93
Cincinnati	80	+ 4	†	†
Colorado	50	None	†	†
Average	71½	+ 1	37	46

†Not reported.

ORIGIN OF MAY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Germany	666	7	.....
Netherlands	5,913	.....	393
Norway	200	.....	1,712
United Kingdom	100	.....	.....
Canada	2,911	.....	.....
Russia	1,145	17,075	.....
British India	4,361	9,611	.....
Cuba	.....	2,079	.....
Brazil	.....	46	.....
Gold Coast	.....	8,784	.....
France	.....	.....	97
Japan	.....	.....	21
Czechoslovakia	.....	.....	400
Total	15,296	37,602	2,623

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	474	3,481	2,496	1,723
France	30	1,321	534	408
Germany	998	144	344	217
Switzerland	15	.....	.....	.....
United Kingdom	5	.....	70	20
Japan	1	.....	.....	5
Sweden	.....	.....	357	.....
Austria	.....	.....	3	.....
Czechoslovakia	.....	.....	1	.....
Total	1,523	4,946	3,805	2,373

Imports, Exports Gained in May

IMPORTS of steel and iron products in May gained nearly 20 per cent over those of April, 1936, and slightly more than 20 per cent over May, 1935, according to figures of the metals and minerals division of the department of commerce.

Imports in May, 1936, were 59,391 gross tons, compared with 49,621 tons in April this year and 47,719 tons in May, 1935. Cumulative imports for five months of 1936 are 259,579 tons and for five months of 1935 they are 149,655 tons.

Most of the gain in May over April came from increased shipments of pig iron, which was approximately 300 tons heavier, ferromanganese 1000 tons larger, spiegeleisen 1800 tons gain and scrap 7000 tons heavier.

May exports totaled 314,950 gross tons, compared with 301,987 tons in April, a gain of 12,963 tons. Scrap grades at 217,439 tons in May gained 20,533 tons over the 196,906 tons imported in April. Finished and semi-finished steel imports were 97,511 tons in May, compared with 105,081 tons in April. Details of exports will be presented in STEEL July 6.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

(In Gross Tons)

Articles	May 1936	Apr. 1936	Jan. thru May,'36
Pig iron	15,296	11,982	80,714
Sponge iron	.....	306	1,128
Ferromanganese (1)	2,623	1,671	9,795
Spiegeleisen	4,589	2,740	12,089
Ferrochrome (2)	.....	.....	1
Ferrosilicon (3)	67	86	375
Other ferroalloys (4)	1	.....	1
Steel ingots, blooms	.....	19	61
Billets, solid, hollow (5)	78	64	310
Concrete reinforc. bars	682	202	1,208
Hollow bar, drill steel	192	185	846
Bars, solid or hollow	3,805	3,302	16,531
Iron slabs	.....	.....	.....
Iron bars	67	35	490
Wire rods	1,690	1,597	8,492
Boiler and other plate	.....	.....	52
Sheets, skelp, saw plate	1,523	2,180	9,117
Die blocks or blanks (5)	1	80	89
Tin plate, taggers' tin and terne plate	38	30	127
Structural shapes	4,946	5,056	22,270
Sheet piling	88	249	864
Rails and fastenings	402	1,720	2,973
Cast iron pipe, fittings	47	30	109
Malleable iron pipe ftgs.	3	6	20
Welded pipe	395	458	2,226
Other pipe	937	1,221	7,163
Hoops, bands for bailing	.....	29	88
Other hoops, bands	2,373	2,681	9,937
Barbed wire	1,069	1 439	8,662
Round iron, steel wire	480	233	1,916
Tel. and tel. wire	.....	5	32
Flat wire, steel strips	261	259	1,204
Wire rope, strand	163	257	1,046
Other wire	85	138	639
Nails, tacks, staples	1,595	2,337	11,324
Bolts, nuts and rivets	80	36	219
Horse and mule shoes	44	35	167
Castings and forgings	76	60	438
Total gross tons	43,696	40,728	212,723
Iron and steel scrap	15,695	8,549	46,512
Grand Total	59,391	49,277	259,235

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content; (5) new classes. No comparable figures for previous years.

Steel a Leading Feature In Great Lakes Exposition

(Concluded from Page 19)

bers of the frame vary in depth from 2 feet at the base to 4 feet at the top, to absorb lateral stresses.

Among exhibitors in this building are:

American Stove Co., Cleveland; Apex Electrical Mfg. Co., Cleveland; Cleveland Wire Cloth Co., Cleveland; Electric Vacuum Cleaner Co., Cleveland; P. A. Geier Co., Cleveland; General Electric Co., Schenectady, N. Y.; Hi-Voltage Equipment Co., Chicago; Iron Fireman Mfg. Co., Cleveland; Murray Ohio Mfg. Co., Cleveland; Strong, Carlisle & Hammond Co., Cleveland; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; White Sewing Machine Co., Cleveland; and Otis Elevator Co.

Through the co-operation of producers of steel sheets, manufacturers of enameled ware and related industries, a joint exhibit in the form of a separate building has been erected, finished in porcelain enameled sheets backed by five-layer plywood. Color scheme of the building attracts the passerby, being executed in blue, violet, mulberry, lemon, orange and red, capped by a large revolving sign with the words "Porcelain Enamel."

Companies participating in erecting this building and in the displays located there are:

American Rolling Mill Co.; Benjamin Electric Mfg. Co., Desplaines, Ill.; Davidson Enamel Co., Clyde, O.; Davidson Enamel Products Co., Lima, O.; B. F. Drakenfeld & Co. Inc., New York; Erie Enameling Co., Erie, Pa.; Ferro Enamel Corp., Cleveland; Great Lakes Steel Corp.; Haskelite Mfg. Corp., Chicago; C. G. Hussey & Co., Pittsburgh; Newport Rolling Mill Co., Newport, Ky.; Otis Steel Co., Cleveland; Pfaudler Co., Rochester, N. Y.; Republic Steel Corp.; Sharon Steel Corp., Sharon, Pa.; Toledo Porcelain Enamel Products Co., Toledo, O.; Youngstown Pressed Steel Co., Youngstown, O.; and Youngstown Sheet & Tube Co.

Further details of this undertaking will be presented in detail in an early issue of STEEL, and from time to time during the summer, STEEL will present a number of additional articles.

Activities of Steel Users and Makers

MICHIGAN TOOL CO., Detroit, has appointed Brammer Machine & Tool Service, Tulsa, Okla., to handle its line of Mitco cutting tools, cemented tungsten carbine tools, gear finishing, lapping and checking equipment, etc., in Kansas, Oklahoma and northern Texas.

♦ ♦ ♦

Lindberg Engineering Co., Chicago, has opened a branch office at 7338 Woodward avenue, Detroit.

♦ ♦ ♦

Cutler-Hammer Inc., Milwaukee, manufacturer of electric motor control apparatus, has moved its Los Angeles sales office to 1331 Santa Fe avenue. W. G. Tapping is in charge.

♦ ♦ ♦

Levinson Steel Co., 33 Pride street, Pittsburgh, structural shape fabricator, has taken over the plant of the John Eichleay Co., 45 South Twentieth street, South Side, Pittsburgh, and will operate the latter as a fabricating shop.

♦ ♦ ♦

Fedders Mfg. Co., Buffalo, will expand its engineering and experimental departments in a large space which it has leased from the New York Central railroad at Black Rock station. Operations are said to be at the peak of recent years.

♦ ♦ ♦

Republic Steel Corp., Cleveland, has added the names of W. L. Blake Co., Portland, Me., and Hunter & Havens, Bridgeport, Conn., to its list of distributors of Toncan copper molybdenum iron sheets. Toncan iron sheets will be handled in addition to the supply of Toncan iron pipe which W. L. Blake Co. has distributed for the past two years.

Meetings

ASSOCIATION of Iron and Steel Electrical Engineers will change its name to Association of Iron and Steel Engineers effective Aug. 1. In making this announcement following the regular monthly meeting of the directors, G. R. Carroll, electrical superintendent, Jones & Laughlin Steel Corp., Aliquippa, Pa., and president of the association, stated that the change had been given formal approval by the membership in a recent vote.

Originally the association was electrical in membership, however, as electrifications became more general, activities became closely allied with other engineering branches of the steel industry. Today, membership is composed of representatives from electrical, mechanical, combustion, lubricating and welding divisions of the industry. It now also includes executives and operating officials.

Headquarters of the association are at 1010 Empire building, Pittsburgh. Brent Wiley is managing director.

CANNERS MEET IN CHICAGO

National Canners association and its allied groups, including the Canning Machinery and Supplies association, will hold their annual convention at Hotel Stevens, Chicago, Jan. 24-29. This will be the tenth consecutive year the association has met at Chicago. A large exposition of canning machinery will be shown in connection with the convention.

Ribs of Steel in 252-Mile Aqueduct

NOT a wierd species of animal, tampering with a monster's cage in a zoo, but two arc welding operators at the Riverside, Calif., plant of American Concrete & Steel Pipe Co. They are joining steel to steel by the electric arc, in fabricating the reinforcement for 16-foot diameter concrete pipe to be used in constructing the $283,000,000 Colorado river aqueduct. This gigantic project will bring a billion gallons of water per day from the Colorado river, 252 miles to cities in southern California

Photo, courtesy Lincoln Electric Co., Cleveland

Forum on Machine Tool Electrification

TO EFFECT a "meeting of minds" between the electrical manufacturing tool industry, Westinghouse Electric & Mfg. Co. was host to a group of machine tool builders at its East Pittsburgh, Pa., works, June 22-26.

Sensing during the last six months a growing and insistent demand on the part of machine tool builders for more complete working knowledge of modern electric drive and control, Westinghouse officials recently issued to engineers and executives an invitation to come in a group and talk over problems.

The response was gratifying. Daily attendance averaged about 60 key men of the industry. Taking the word "forum" literally—as Westinghouse hoped they would—these men not only listened attentively to the electrical manufacturer's side of the story, but also criticized constructively some of the equipment that is now being offered to machine tool builders.

The most definite demands were for better finish, greater accuracy, further standardization and devices which will lend themselves better to "building-in." Consensus of opinion was that regular equipment now available is satisfactory for any ordinary commercial applications, but the finer machine tools call for some extra degree of refinement, especially when the electrical equipment is to become an integral part of the machine.

Had Wide Scope

Scope of the forum can be indicated briefly by mention of subjects. These were: Motors; control; application; miscellaneous; and viewpoints of buyers and users. A paper, "Developments in Research," was presented by L. W. Chubb, director of research—supplemented by a visit to the research laboratories. Two trips were made, one emphasizing motor and control manufacture, the other helping to visualize machine tool trends.

From the time of the welcoming address by Dr. S. M. Kinter, vice president in charge of engineering, on Monday, to the farewell dinner and entertainment at Webster hall on Friday evening, there was something of interest every minute.

Among others, credit is due to R. S. Elberty, W. D. Turnbull, Bernard Lester, Charles Steinbach, R. W. Owens, T. I. Phillips, L. D. Rigdon and J. R. Weaver for conception and carrying out of the forum.

T. E. Millsop

Weirton Steel's New President, 37, Was Salesman 10 Years Ago

ONE of the nation's youngest steel executives, T. E. Millsop, 37, has been elected president of Weirton Steel Co., Weirton, W. Va., succeeding the late J. C. Williams.

Mr. Millsop started with Weirton in 1926 as a salesman. He was appointed assistant general manager of sales in the sheet and tin plate department, then assistant to the president. In 1934 he was elected a vice president and in October, 1935, was appointed executive vice president.

Ernest T. Weir, chairman of the board of Weirton and of National Steel Corp., of which Weirton is a subsidiary, in announcing the election by directors last week, said:

"At 37 years, Millsop is probably the youngest high executive in the steel industry."

The growing group of "young men" in the top ranks of the industry includes B. F. Fairless, 46, president, Carnegie-Illinois Steel Corp., R. J. Wysor, 49, vice president and general manager, Republic Steel Corp.

Born in Sharon, Pa., Mr. Millsop went to work in 1913 in the open-hearth department of Carnegie Steel's Sharon plant. He worked in mills at Farrell, Pa., Ensley, Ala., and Butler, Pa., then enlisted in the Canadian army during the World war.

After the armistice he toured the country for six months giving flying exhibitions before returning to the steel industry.

Williams' Funds for Public

Principal and income from an $830,000 trust fund are to be used for the advancement of general welfare in Steubenville, O., Weirton, W. Va., and vicinity under an arrangement made by the late John C. Williams, president of the Weirton Steel Co., before his death June 1.

Mr. Williams created the trust by transferring to the Fidelity Trust Co., Pittsburgh, the trustee, 12,222 shares of capital stock of the National Steel Corp. The income of this stock is to go to his widow, Mrs. Anna D. Williams, during her lifetime.

After her death the money may be used for building hospitals, endowing playgrounds or assisting charitable organizations. Mr. Williams directed that powers of the trustee shall be liberally construed.

Financial

INLAND STEEL CO., Chicago, has been granted permission to list 59,000 additional shares on the New York Stock Exchange. The shares will be used in acquiring stock of Milcor Steel Co., Milwaukee and Canton, O., for which negotiations have been under way for some time. Inland is to acquire not less than 95 per cent of the 89,693 shares of Milcor stock by exchange.

Dividends Declared

Sharon Steel Corp., Youngstown, O., has declared an initial dividend of $1.43 on the convertible preferred stock, payable July 1 to record June 26. This includes 18 cents for the period from March 19 to March 31, the unexpired portion of the first quarter during which the stock was in existence; and $1.25 for the quarter ending June 30.

Container Corp., Chicago, one of the largest producers of shipping containers, declared 25 cents a share, first to be paid since Jan. 1, 1931, when 30 cents was distributed. Business in June reversed the usual seasonal trend and will be the best so far this year.

Rebuilding Hamilton Coke & Iron Co. Stack

Work has been started on rebuilding the blast furnace of the Hamilton Coke & Iron Co., New Miami, O. The furnace will be modernized and ready for operation about Sept. 1. Cost will be approximately $300,000. Daily capacity will be about 700 tons. The work is in charge of Arthur G. McKee & Co., Cleveland.

Since 1928 the furnace at times has supplied hot iron to the American Rolling Mill Co., Middletown, O., and merchant iron for Miami valley foundries.

Production of iron near Hamilton was begun in 1907 when the blast furnace was installed by the Hamilton Furnace Co. at Coke Otto, named for a series of coke ovens. The village subsequently was renamed New Miami. The plant since May, 1927, has been operated by the Hamilton Coke & Iron Co.

Men of Industry

CLAYTON R. BURT, former president, Pratt & Whitney Co., Hartford, Conn., has been made president of the Niles-Bement-Pond Co., which has taken over the assets of Pratt & Whitney. Mr. Burt received his early training at the plant of Brown & Sharpe Mfg. Co., Providence, R. I., and later became connected with the Barber-Coleman Co., Rockford, Ill. Before becoming identified with Pratt & Whitney in 1924, he served as president of the New Process Gear Co., and resigned that post to become president of the Austin Machinery Co. Mr. Burt is first vice president of the National Machine Tool Builders' association.

♦ ♦ ♦

Norman D. Carpenter, formerly traffic manager and later identified with sales work for West Leechburg Steel Co., Pittsburgh, has been appointed assistant vice president of Superior Steel Corp., Pittsburgh.

John N. Kerr, associated for several years with the general sales department of West Leechburg Steel Co., has been named manager of carbon steel sales for Superior.

Walter G. Blume, associated with Superior since 1917 and formerly assistant general manager of sales, has been named manager of carbon steel sales.

William B. Holt has been appointed general superintendent at the company's works, Carnegie, Pa. He was made assistant works manager in 1921 and production manager in 1928.

Kenneth W. Massey has been appointed manager of development and research. He has been associated with Superior since 1926, and previously had been assistant to the president, Frank R. Frost.

♦ ♦ ♦

Clifton N. Windecker has resigned as vice president of the Diamond Alkali Co., Fairport, O., effective July 1, and will be succeeded as general manager in charge of manufacturing by James C. Hobbs.

Clayton R. Burt

♦ ♦ ♦

Charles B. Bohn, president, Bohn Aluminum & Brass Corp., Detroit, has departed for a tour of Europe during which he will study engineering development abroad.

♦ ♦ ♦

Dr. Russell P. Heuer, in charge of research and development work, General Refractories Co., New York, has been elected a director of that company.

♦ ♦ ♦

Myron C. Taylor, chairman of the board, United States Steel Corp., New York, sailed for Europe June 20, to visit offices of the Corporation in principal European countries.

♦ ♦ ♦

J. Leslie Lenton has been appointed western representative, with headquarters in Chicago, for the New Britain-Gridley Machine Co., New Britain, Conn., manufacturer of automatic machinery.

♦ ♦ ♦

A. M. MacCutcheon, vice president of engineering, Reliance Electric & Engineering Co., Cleveland, has been elected president of the American Institute of Electrical Engineers. He became associated with Reliance in 1914 and has been a director since 1920 and a vice president since 1923.

♦ ♦ ♦

Ralph H. Watson, vice president in charge of manufacturing, United States Steel Corp., New York, has assumed in addition to his own, the duties of the late Edwin E. Ellis, vice president in charge of production of ores and other raw materials and of the movement of ore on the Great Lakes.

♦ ♦ ♦

William E. Blackburn, formerly manager of sales at Cincinnati for the Carnegie-Illinois Steel Corp., Pittsburgh, has been placed in charge of the newly opened district sales office in Indianapolis, with headquarters in the Chamber of Commerce building.

♦ ♦ ♦

S. S. Buckley, formerly eastern representative of the Vulcan Mold & Iron Co., has been placed in charge of sales for the Superior Mold & Iron Co., Penn, Pa. Mr. Buckley has had wide experience in mold practice, and is familiar with electric steel requirements, having served as president of the Onondaga Steel Co., Syracuse, N. Y.

♦ ♦ ♦

L. J. Wise, Chicago Malleable Castings Co., has been elected chairman of the Chicago chapter, American Foundrymen's association, for the coming fiscal year, succeeding James Thomson, Continental Roll & Steel Foundry Co. Other officers chosen include: Vice chairman, H. W. Johnson, Greenlee Foundry Co.; secretary, F. B. O'Neil, Western Foundry Co.; treasurer, C. C. Kawin, Charles C. Kawin Co.

♦ ♦ ♦

Joseph F. Bode, Briggs & Stratton Corp., Milwaukee, has been elected president of the Milwaukee Association of Purchasing Agents. Other new officers are: Vice president, Henry A. Steffen, Wadhams Oil Co.; secretary, C. C. Bremer, Interstate Drop Forge Co.; treasurer, Theodore H. Schultheis, John Rauschenberger Co.; national director, T. C. Child, Allen-Bradley Co.; local director for four years, C. A. Kelly, Bucyrus-Erie Co.

♦ ♦ ♦

J. C. Bloomfield has joined the shovel, dragline, crane sales division of Link-Belt Co., Chicago, and will spe-

(*Please turn to Page* 30)

Norman D. Carpenter

John N. Kerr

BEARINGS THAT WIN -AND HOLD- *Confidence*

Behind every New Departure Ball Bearing are ceaseless investigation, endless experiment to improve, to develop, to make possible for tomorrow something even better than today's best.

Because of this constant urge to advance, to create yet higher standards, the machine builder may be completely confident that New Departure's resources for development and research . . . the broadest in the industry . . . have made available for his use today the very best that Mastery of the ball bearing art has produced.

The New Departure Mfg. Co., Bristol, Conn.

NEW DEPARTURE
BALL BEARINGS

RADAX

Will resist single direction, combined radial and thrust loads, or, mounted two bearings opposed, will sustain heavy thrust from either direction.

STANDARD SINGLE ROW

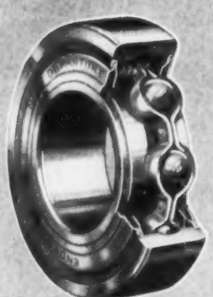
Either non-filling slot or maximum capacity types. For radial or combined loads where thrust is moderate.

SHIELDED SINGLE ROW

Single Row bearings with steel shield forming closure against dirt or foreign matter. Also available shielded both sides.

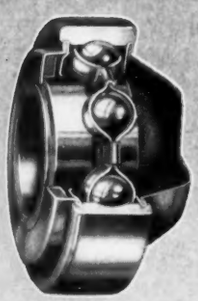
SNAP RING BEARINGS

Standard single row types with snap ring in groove on bearing O. D. for axial location. Also available on Double Row.



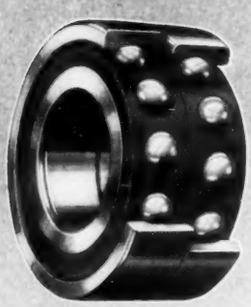
DOUBLE N-D-SEAL

Permanent felt seals on both sides; keep lubricant in and dirt out. No attention required. Lubricated for life.



CONVEYOR ROLL

Designed to accommodate spherical end stub shaft; eliminates special closures, adjusting nuts, springs, collars, long shafts. Permanently sealed.

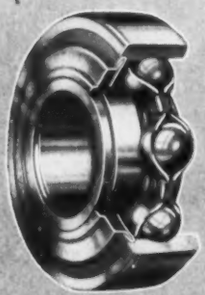


DUPLEX BEARINGS

Single Row Angular Contact in matched pairs. For thrust from either direction. Assure rigid radial and axial location.

FLANGED PRECISION

Single Row Angular Contact with locating flange on bearing O. D. Made to extremely close tolerances for precision spindles.



N-D-SEAL

Fitted with permanent, precision - made, felt seal which excludes dirt and retains lubricant. Furnished lubricated ready for use.

DOUBLE ROW

Resists heavy combined loads from any direction and in any combination. Preloaded for maximum rigidity and long life.

SHIELDED DOUBLE ROW

Double Row bearings with plate shield permanently attached to one side of outer ring, forming closure against dirt or foreign matter.

SHIELDED N-D-SEAL

N-D-Seal bearing with steel shield on side opposite seal. Shield keeps out dirt and protects bearing during mounting.

MIRRORS of MOTORDOM

DETROIT

ON THE subject of crystal gazing, Detroit has about resolved that by another year from this writing, Packard—taking consideration of all motordom's producers—will have made some very conspicuous headlines.

According to present plans, and of course assuming they will be realized, Packard by that time will have three complete series of cars in the low and middle-price fields.

The first of the three, which as the general public now knows, is the 120, a line of eights now over a year old that, in the $1000 bracket, has built up a following of over 50,000.

The second is the line of sizes, referred to as the 115's set to make their bow in August, priced below $800 mark.

The third is another complete Packard series, with preparations to begin in earnest this fall.

This latter, now on the boards and with the approval of Packard management, seems likely to be dropped into a price range just above the present 120, or into the $1500 field. Though that much may be tentatively settled, much depends on the success of the six in the coming fall months.

Once the six is well on its way, Detroit expects Packard to get busy on retooling and estimating for the third series.

Packard 6 Assemblies Start Soon

That the present large Packard super eights and twelves will be continued is not to be doubted, for Packard's following in this price field is clearly definable. In fact, even the adoption of the 120, with its subsequent enlargement of dealer outlets, is alone credited with a 30 per cent gain in sales of the high-price Packard model this year.

Parts suppliers for the new six have been instructed to have supplies flowing into the Packard plant by July 15. On Aug. 15, assemblies are expected to be up to 300 sixes daily.

It is likely that a maximum of 500 models daily will be attained by September, during the time the field is being stocked and before the inevitable leveling off sets in. In round figures, 25,000 sixes are to be made in the remainder of 1936.

Interchangeability of parts with the 120 will iron out many of the production difficulties. As an example, many of the motor parts, even though one is for a six and the other for an eight, are interchangeable; likewise, a number of the body's component parts. One assembly line can be used for both series at the same time.

Detroit still is happy over the excellent early summer showing of the automobile industry.

June Sales Continue High

There have been a number of instances recently where manufacturers have been forced to buy supplementary materials for 1936 assemblies. A few weeks ago it was thought that all buying against present models had been completed.

In the first place, May's retail sales of 400,000 models pared down field stocks to a greater degree than was expected. Current reports from the field indicate that June so far has kept up the same showing.

Therefore, since many of the new 1937 tools and dies are nearly ready, and the motor plants are anxious to swing over soon, they have been required to raise late June and July schedules on the present lines, so as to have the field fairly well stocked.

Last week Ford completed a steel buy for 45,000 jobs, representing material for an additional 30,000 cars. Chevrolet also came into the market for steel for 23,000 cars.

Chevrolet's assemblies, which held the lead at 30,000 passenger cars and trucks last week, are likely to hold this rate through most of July. It will be necessary to schedule operations on several Saturdays next month for Chevrolet to round out its 1936 quota.

Beginning Aug. 1 there will be a series of suspensions in the various Chevrolet parts plants. The first, to start July 21, will be at Bay City. Other divisions will begin Aug. 1, Aug. 15 and Sept. 1. Shutdowns will be long enough only to permit changes necessary to prepare for 1937 models.

For a privileged few June 22, General Motors rolled a couple of 1937 Chevrolets out onto the Milford, Mich., proving grounds and put the new jobs through their paces. Though hand-made and assembled, these counterparts of next year's Chevrolet models demonstrated that General Motors has probably changed Chevrolet more than any other of its cars. Chevrolet dealers will not be called in to preview the new jobs for another six weeks to two months.

Regarding Ford's plans there is more than the usual speculation. A schedule of 80,000 has been set up by Dearborn for July, and as previously related, unusually good summer demand has caused some upward appraisal of materials buying for the V-8. Last week Ford accounted for 24,000 assemblies.

But last week Ford, usually receptive to visitors who want to go into the plant, refused passes. Which appeared to them to confirm rumors that a new model is nearing an advanced stage.

Small V-8 Motors Accumulating

The Ford tool division is heavily engaged six days weekly, and there has been some stir in new machine tool purchases, two outstanding units for motor block work having been purchased recently.

A bank of the small V-8 motors is accumulating. Though Ford would use the present V-8 wheelbase, frame, body and most mechanical features for the smaller motor, it wants to cut down on total car weight. Fender and body panels of 18 gage steel will not be changed, but substitution of 19 and 20 gage sheets in flooring, inside door sections and other invisible parts where 20 gage is now used, will give the desired effect. Designers at Dearborn have been working to this end.

Those who have seen the small 8-cylinder Ford motor say that weight-saving has also entered prominently into its design. For certain parts of the block base, ordinarily

cast, stamped sheet metal braces have been recommended.

If the small Ford comes to be taken out of the experimental shop and put on the assembly line observers in the industry have some interesting comments. One concerns manufacturing, the other price. On production, the critics seem to think that never having made two cars in one plant before, Ford will run into many "bugs" keeping things moving smoothly. On price, shaving $100 or so off the present V-8 would put the small job down to competing in the range of the used car market.

Incidentally, Ford's price increase of $20 per model on all deluxe units last week was seen by some observers to be another point in favor of supplementing the entire V-8 line with the small job.

On the subject of small cars, Willys at Toledo has a wider tread, longer wheelbase model for next year. The motor will still be a four. Some of the Willys die work has been held up.

American Bantam Car Co., organized a few weeks ago at Butler, Pa., claims to be set to make commercial cars but probably will be more competitive with motorcycle sidecars, judging from advance notices. The company lays claims to 45 miles to the gallon with its unit, which will sell at $295 to $345, f.o.b. plant. This company will use the former American Austin plant for its production.

Pressure is beginning to appear from diemakers for buyers to accept deliveries on 1937 dies and the carmakers would like to accommodate, but the call for 1936 models won't permit the interruption. In fact, the two to three-week period usually necessary for experiment in the press shop with new dies is something the motor plants would like to get around to, but apparently they can't spare the time.

Chrysler, for example, at the Dodge stamping plant, has been ready for a week or so to take in new dies and get the decks cleared for 1937 jobs. But with Plymouth making 12,000 finished cars, as last week, Dodge accounting for 8700, Chrysler 1250, and DeSoto 975, no orders for press-down time can be given.

Fisher Body is another, typical of this condition. About the best promise some of the diemakers can get for the buyer to take in his purchases is "sometime in July." This does not infer that all die foundries are finished with their work and choked for space to store the finished dies, for some are in arrears and booked up solid for several months. But it shows how car manufacturers are bent on draining the last drop out of the market for the 1936 models.

Some, however, have taken matters into their own hands and have indicated they will fill their orders with 1937 models. Olds, which changed over largely to 1937 work ten days ago, is one in this class, and Buick may be before many more weeks.

If the condition in Fisher Body's and Chrysler's plants persist, these interests will be forced to ship their dies to other press shops and thus depend on outside sources for the first lots of stampings.

Chrysler did this last year, starting off the 1936 season with fully 40 per cent of its stampings coming from the outside. Gradually, most of these were recalled, but the charges for double handling of dies, plus other costs, are something the motor people try to avoid if they can.

Chrysler Re-equipping Plant

By next year Chrysler will have the Wyoming avenue, Detroit, plant in shape to take care of the temporarily tight situation incident to every model change. This division, now being enlarged and re-equipped, will not only be devoted largely to DeSoto assemblies, but will supplement the Dodge stamping division. Incidentally, Chrysler last week bought used machine tools for the maintenance shop it will establish at the Wyoming avenue division. No die shop is going in there, contrary to earlier presumption.

DeSoto has virtually finished production on an order for 2200 taxicabs for the Sunshine Radio System Inc . . . . Ford is surveying sites in Barcelona, Spain, for an assembly plant that would have capacity of about 100 cars daily.

Automobile Production

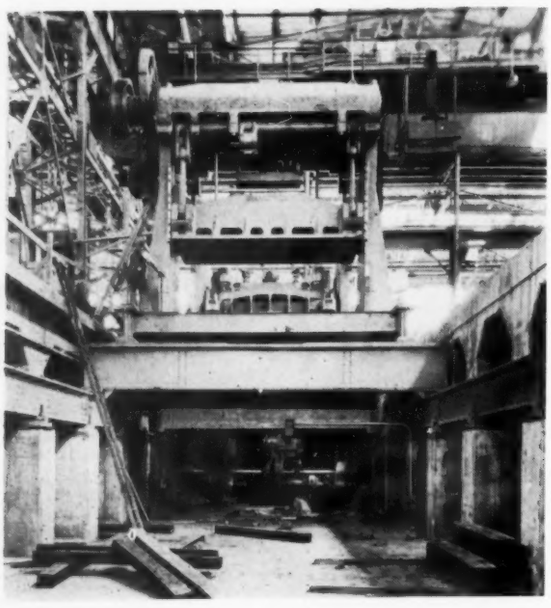
Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
5 mo.	1,407,786	1,861,915	2,035,921
June	306,477	356,340	.....
July	264,933	332,109	.....
Aug.	234,811	237,400	.....
Sept.	170,007	87,540	.....
Oct.	131,991	272,043	.....
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:	
May 29	108,300
June 6	101,896
June 13	100,415
June 20	100,733
June 27	99,695

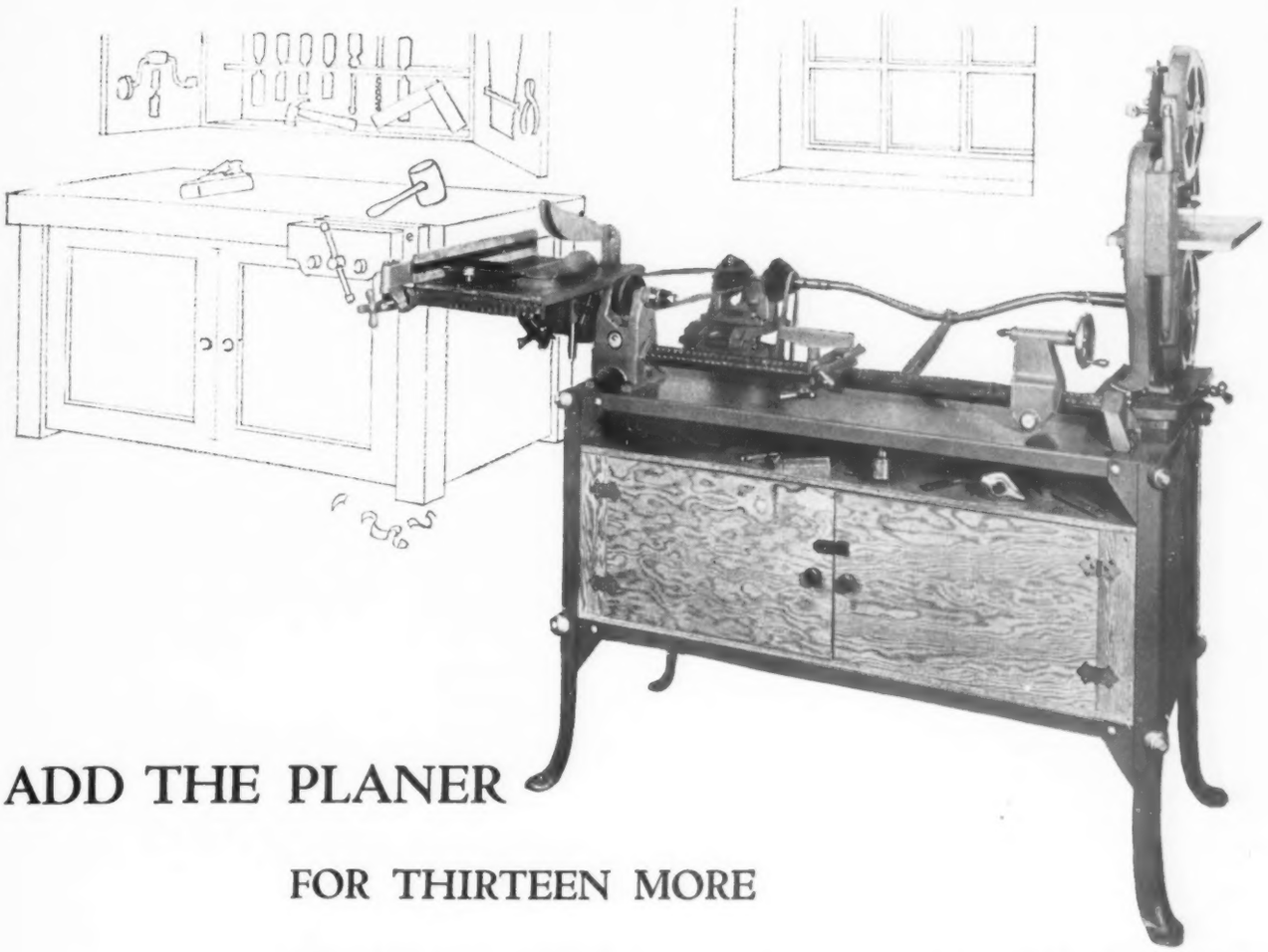
Steel Titans Make Steel Turret Tops



GIANT presses to form steel turret tops at the Grand Rapids stamping division plant of General Motors stand on girders weighing 2000 tons, over a pit which covers an acre. This pit is 16 feet, 6 inches deep, with walls 24 inches thick at the bottom, and a floor 4 feet thick. Each press weighs more than 2000 tons

The Research was done, the Alloys were developed and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99+% UNIFORM QUALITY) ZINC



ADD THE PLANER

FOR THIRTEEN MORE

ZINC ALLOY DIE CASTINGS

As shown in the photograph, this "workshop" unit utilizes 26 ZINC Alloy Die Castings for economy, rigidity of construction and improved appearance. Add the planer which easily replaces the band-saw and there are 13 more ZINC Alloy Die Castings—a total of 39.

Besides pulleys and brackets which are almost universally die cast for units such as this—die cast guards have extra rigidity, smooth beaded edges—calibrated gauges are die cast clear and sharp—several one-piece die cast housings eliminate units otherwise subject to loose assembly. All of these advantages are gained through the use of ZINC Alloy Die Castings at a very economical manufacturing cost.

In this particular unit, there are die castings of all shapes and sizes—some must have strength, some precision of detail, others close tolerances. ZINC Alloy Die Castings meet all these specifications. Have you carefully checked their possibilities with respect to your products?

We try to keep abreast of the Die Casting industry in our publication, *The Alloy Pot*. We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.

THE NEW JERSEY ZINC COMPANY

160 Front Street — New York City

New Jersey Zinc

Men of Industry

(*Concluded from Page 25*)

cialize on the application of Link-Belt machines to railroad service.

L. P. Spillan, for many years a member of the department, has been appointed shovel and crane division sales manager in charge of sales to contractors, with full supervision over all sales agents and distributors.

N. A. Weston has been given charge of shovel division industrial sales in the Chicago district, and G. H. Olson has been made shovel and crane division general manager.

Tin Plate Decree Bans Agreements

AN ORDER by the federal trade commission last week directed 15 manufacturers of tin plate to cease and desist from entering into agreements not to sell or quote prices on "stock plate" to jobbers and container manufacturers.

Counsel for the producers, after the ruling, expressed continued confidence in their contention that the action had been necessary to stop violations of the steel code. Improved manufacturing methods, they asserted, had so materially reduced the quantity of tin plate sold as "stock plate" that production was fast becoming negligible in 1934 when it was decided to discontinue the classification before the end of that year.

The commission's order directed also that the companies cease entering into agreements to cut up or mutilate "stock waste" so as to classify it as "waste-waste" for domestic sale, while offering it for sale in foreign countries without mutilation.

According to the findings some of the "stock plate" produced and accumulated by the companies since Jan. 1, 1935, had been sold as "production plate" at prices higher than ordinarily received for "stock plate."

The companies asserted in their answers that many manufacturers, acting in alleged evasion of the code, sold tin plate as "stock plate" which should properly have been classified as "production plate," that the respondents considered such practices unfair to manufacturers and purchasers of tin plate and believed corrective action should be taken within the industry.

All the respondents in their answers admitted the material facts alleged in the commission's complaint, and consented that the commission might enter its findings without further procedure and serve an order to cease and desist.

L. B. Schumacher

Who has been made manager of sales, reinforcing division, Truscon Steel Co., Youngstown, O., as noted in STEEL, June 22. He formerly was in charge of reinforcing bar sales for Jones & Laughlin Steel Corp., and prior to that was associated with Illinois Steel Co., Chicago, and Laclede Steel Co., St. Louis

Died:

W. G. BLACK, 59, vice president in charge of purchases and stores, Chesapeake & Ohio railroad, the Nickel Plate road and the Pere Marquette railway, Cleveland, in that city, June 20. Prior to entering railroad service, he was associated for three years with the Illinois Steel Co., South Chicago, Ill.

♦ ♦ ♦

Charles A. Gillham, 62, vice president and general manager, New York Steam Corp., in New York, June 19.

♦ ♦ ♦

John Mittendorf, 70, for many years general superintendent of the Central Frog & Switch Co., Cincinnati, in Indianapolis, recently.

♦ ♦ ♦

C. S. Powers, 52, for the past six years sales manager of the Tulsa, Okla., office of the Republic Steel Corp., in Tulsa, June 19.

♦ ♦ ♦

F. Paul Rogers, in charge of the cost department of Firth-Sterling Steel Co., McKeesport, Pa., at Lakeworth, Fla., June 22.

♦ ♦ ♦

John Charles Junkin, 69, president, Junkin Safety Appliance Co. Inc., Louisville, Ky., in Hamilton, Ont., June 3.

♦ ♦ ♦

Millard J. Roberts, 40, general manager, Timken-Detroit Axle Co., Detroit, in a hospital at Windsor, Ont., June 16, of injuries received in an automobile accident.

♦ ♦ ♦

Walter H. Flood, for the past 20 years superintendent of the Standard Tube Co., Woodstock, Ont., in that city recently. Ill health forced his retirement from active duties in April of this year.

♦ ♦ ♦

Isaac Rothstein, 61, of the United Scrap Iron & Steel Co., Brooklyn, N. Y., in that city June 16. Mr. Rothstein was a member of the New York chapter of the Institute of Scrap Iron and Steel.

♦ ♦ ♦

G. H. Kelly, 59, vice president and treasurer, White Motor Co., Cleveland, in Cleveland, June 23. He had been with White Motor since 1915, and prior to that he was secretary for Baker-Raulang Co., Cleveland.

♦ ♦ ♦

T. C. Raleigh, former superintendent of the American Steel & Wire Co. rod mill, Cleveland, in Cleveland, June 24. Mr. Raleigh began working for the company when 11. His rise was steady and for more than 30 years was chief roller. He retired in 1933, after serving the firm 52 years.

♦ ♦ ♦

Elihu H. Cutler, 80, an early manufacturer of automobiles, June 21 at his home in New York. In the late '80's he was a founder of the Electron Mfg. Co., builder of electric batteries, motors and elevator controls, which later was absorbed by the Otis Elevator Co., Yonkers, N. Y.

♦ ♦ ♦

Charles R. Cannon, 69, former superintendent of the stock and receiving department of the Brown Hoisting Machinery Co., Cleveland, in that city, June 25. In 1891 he became a stock clerk for the Brown Hoisting company, and advanced to the superintendency from which he resigned in 1921.

♦ ♦ ♦

William Fawcett Osborn, 75, chairman, Samuel Osborn & Co. Ltd., Clyde Steel Works, Sheffield, England, at his residence, Snaithing Grange, Sheffield, June 16. Mr. Osborn's connection with the company dates back to 1878; he was made a partner in 1885, and had been chairman since 1905.

Issues Mining Directory

Seventeenth edition of the Mining Directory of Minnesota, compiled by John J. Craig, and published by the mines experiment station of the University of Minnesota, Minneapolis, has just been issued. The 246-page directory contains maps showing the name and location of all operating mines, exhausted mines, and reserve properties; a list of mining properties that contain merchantable ore; a list of mining companies and holding organizations identified with the Minnesota ranges; and general statistics on iron ore mining.

WINDOWS OF WASHINGTON

WASHINGTON

THE second session of the seventy-fourth congress died hard. It was not known definitely until midnight Saturday, June 20, whether the slate could be cleaned before the Democratic convention. In fact, the house put its clock back an hour or so and continued well on to Sunday morning—not on legislative work, but on making whoopee.

During the closing hours, the senate finally enacted the tax bill and then went on to the Guffey coal bill, which it was discussing at adjournment.

Business interests of the nation will not be plagued by congress again now until Jan. 5. Even on this small matter of picking the date the senate took a beating, as it seems to have done during most of the second session.

Under the Norris "lame duck" law congress is mandatorily expected to convene on Jan. 3. That date next year falls on a Sunday and congress did not want to convene then. The senate passed a resolution that it would meet on Monday, Jan. 4. The house took exception to this and passed a resolution in favor of Jan. 5. A compromise had to be reached and the house won out.

Filibuster Fails

Prediction was made in these columns last week that no one could forecast what bills would be passed during the hectic hours before adjournment. This turned out to be correct.

Adjournment climaxed a hopeless, night-long filibuster in the senate for and against the new Guffey bill, which proved to be the only major New Deal measure caught in the last minute jam.

The massive figure of John L. Lewis of the United Mine Workers stood behind the futile effort to force passage of the coal bill.

Leaning forward, attentive, from a front seat in the gallery, Lewis' shaggy eyebrows bristled as the floor debate went on and on. Fighting his hopeless battle on the floor were Senators Guffey and Neely. Spearhead of the floor fight to defeat the bills was the youngest senator, Rush Holt of West Virginia, who won his way into the senate with mine worker support, but later broke sharply with Neely and Lewis.

It was a two-way filibuster, with friends of the bill fighting to stave off a vote on adjournment, and Senators Holt and Borah, with others, equally determined to ward off a vote on the bill.

Rips Politics

Senator Holt started to speak an hour before midnight and announced that he would speak until morning if necessary. He ripped into both Neely and Lewis, and charged the Guffey bill was nothing more than an attempt to win Pennsylvania votes and to prime Lewis for the presidency in 1940.

Last week Mr. Lewis had a conference with the President for more than an hour in the private study of the White House. There were varying stories told about the conference but Lewis stated later that he would support Mr. Roosevelt again for President.

The Healey-Walsh government contract measure was passed during the closing hours of the session. This was indicated last week in these columns in view of the fact that the A. F. of L. was putting pressure on congressmen. The bill sets rigid hours and working standards and wages for firms manufacturing all kinds of supplies for the government.

Passed by the house on the last day of the session, this measure was slipped through the senate during a lull in the debate on the Guffey bill. Too late, opponents of the measure offered a motion to reconsider, but the move failed.

As this is written the contract bill has not been signed by the President but there is every indication that it will be. He intimated at a press conference last week that he saw no objections to the law.

Some business representatives here are of the opinion that the measure will be somewhat like the prohibition law—that it will not be enforced and cannot be enforced. Representatives of the steel industry here say that it will not greatly affect steel companies bidding on steel for the government. Most concerns are abiding by hour and wage provisions of the old NRA codes and also conforming to child labor provisions.

One high government official, who refused to be quoted on the matter, has the feeling that the law will work to the benefit of larger producers in all lines—because in general they already are conforming closely to hour and wage provisions.

In some quarters it is believed labor will be given a chance to "snoop around" in the steel mills to see that the hours and wage provisions are being enforced. Of course, labor will have a chance to go to the national labor relations board, bringing a case against any company. If the board rules against the company it will not be able to do any government business.

CENSUS PLANS CONTINUE IN DISCUSSION STAGE

At a meeting of a special committee of Major Berry's council for industrial progress, held last week to consider the unemployment problem in industry, discussion centered on a proposed census of industry and trade workers which would be made at least every five years. Every year a partial census of representative samples, or cross sections, would be made to establish trends and give a substantial basis for current yearly estimates of employment.

The unemployment census situa-

tion is mostly talk, it appears, because it would be obsolete before it could be completed. Still these committees, trying to find some way to justify their existence, continue to make outlines for a census.

The Berry organization hasn't the backing of anyone of any consequence in industry and it is only a question of time when it will fall of its own weight.

Following its meeting last week, the unemployment committee announced that it discussed the possibility of staggering the years in which the general census is taken, to provide an even flow of employment and activity for the census bureau, and to maintain a staff of trained personnel. This apparently is about as far as the committee can see—keeping a few people on the payroll all of the time in one government bureau—instead of taking them on and then letting them go.

ACTION ON STEEL BIDS WILL NOT BE HASTY

The President's letter to the attorney general asking the latter to take "appropriate action" in connection with the collusive steel bidding report of the federal trade commission aroused much comment in Washington.

Attorney General Cummings was in Philadelphia at the convention all last week and inasmuch as the report was transmitted by letter from the President direct to Mr. Cummings other officials of the department of justice refused to comment.

However, a good many interesting observations were made. In the first place, it is a foregone conclusion that the department of justice will not start court proceedings against any of the steel companies without being very sure of its ground. There is considerable ill feeling between that department and the federal trade commission and it is inconceivable that the department of justice will be hasty.

John Dickinson, former assistant secretary of commerce, is now the assistant attorney general in charge of anti-trust prosecutions and he has stated several times that he is not opposed to the basing point system. This, in itself, may mean something.

Again, it has been pointed out that the sending of this report to the attorney general may merely have been a political gesture. The Republican platform contains a strong anti-monopoly plank, Senator Borah has come out along the same line and the President may have had this in mind when he released the report just at the beginning of the Democratic convention.

Attention has been called to the fact that the President asked the attorney general to take "appropriate action" on the report. Appropriate action may simply be to ditch the whole report after a reasonable length of time.

There are certain things that the attorney general apparently has to do, including (1) draw up a letter to purchasing officers of the government and (2) submit recommendations for the next congress. The President asks that these moves be made and apparently they cannot be overlooked. It is known that Secretary of Commerce Roper is very much put out about the steel report. He was informed 24 hours before the report was made public that there would be no outburst against the steel companies. This was during a conference which he was having with officials of his own department regarding closer co-operation between industry and his department.

At any rate, the next move is up to the department of justice and it is impossible to forecast at this time whether the move will be made soon.

The national labor relations board has ordered the Mann Edge Tool Co., of Lewiston, Pa., to cease from interfering with its employes in connection with their joining labor organizations for the purpose of collective bargaining and to reinstate certain of its employes who are said to have been discharged because of union activities.

DRIFT BACK TO FARMS INTERESTS ROPER

One of the matters discussed at last week's meeting of the Roper business advisory council was population trends. The secretary of commerce in asking for a study of this subject, pointed out the possible economic significance of figures just revealed by the census bureau showing a drift of almost two million people back from cities to farms, from 1931 to 1935. The council agreed to consider the possibility of bringing these figures up to date, and to make a continuous study of the problem for the determination of causes and effects.

AUSTRALIAN STEEL INDUSTRY SHOWS PROGRESS

The expansion of Australia's domestic iron and steel industry in recent years is indicated in a report to the commerce department from Trade Commissioner E. C. Squire, Sydney.

This industry is centered in New South Wales and is controlled by one company—The Broken Hill Co., Ltd., which last year absorbed its only competitor, Australian Iron & Steel, Ltd.

Production figures issued by Broken Hill covering the operations of its steel works at Newcastle indicate that the output of both pig iron and steel ingots in the company's financial year closing May 31, 1936, will be in excess of 600,000 tons each, thus establishing a new record. This compares with 521,000 tons of pig iron and 553,000 tons of steel ingots produced in 1934-35, the previous peaks.

Production figures of Australian Iron & Steel, Ltd., are not available, but as Broken Hill produces over 75 per cent of the pig iron and steel ingot output of Australia, figures of the latter company give a satisfactory indication of the trend of production, it is pointed out.

According to a statement recently made by the managing director of the Broken Hill Co., the combined annual ingot tonnage of the two plants is now greater than that of the works controlled by any other individual company in the British Empire.

PRESIDENT EXPLAINS LIFTING OF MUNITIONS BAN

President Roosevelt last week revoked his proclamation forbidding exports of arms, ammunition and implements of war to both Italy and Ethiopia.

Explaining the revocation, the President stated that "having now ascertained that, in fact, the conditions which led to the issue of the proclamations have ceased to exist, I have, in conformity with the duty imposed upon me, issued proclamations revoking my earlier proclamations. Therefore the statements which I issued in respect to commercial transactions with the belligerents are no longer applicable."

TIN PLATE SCRAP REPLIES FLOWING IN

Several hundred replies have been received by the state department from tin plate scrap producers to whom questionnaires were sent on May 20 asking for statistical data on the production or sale of the material. In accordance with the new law, the department on July 1 will start to issue licenses for exportation of this scrap if it is found advisable.

Figures at the department of commerce show that during 1935 exportations of this scrap totaled only about 35,000 tons.

The information is desired for the files of the national munitions control board in connection with the administration of the act "to provide for the protection and preservation of the domestic sources of tin."

PATMAN BILL SIGNED

To the surprise of many observers, the Robinson-Patman anti-price-discrimination bill passed congress during the closing days of the session. It has been signed by the President. The ship subsidy bill also passed. This takes away from the department of commerce the emergency fleet corporation and the shipping board but leaves in the department the bureau of navigation and steamboat inspection.

Editorial

Great Lakes Expo Helps To "Sell" Industry to Public

THE Great Lakes exposition, which opened in Cleveland Saturday, June 27, and will continue 100 days until Oct. 4, holds more than usual interest for the iron, steel and metalworking industries. This is due to the fact that this event, to a greater extent than many predecessors of similar character, is definitely keyed to the activities of an important industrial region.

As implied by its name, the exposition was conceived for the purpose of dramatizing the economic importance of the Great Lakes area. It is an attempt to visualize for the public the significance of mineral resources, transportation, production and manufacturing activity, agriculture and other factors in the development of the eight states which are contiguous to the world's greatest inland waterway. The scope of its dramatization extends from the iron and copper ore ranges of the Superior country, through the industrial Ruhr of the lower lakes region to the upper tier of New York state where the waters of Superior, flowing through the St. Lawrence outlet to the sea, pass beyond the limits of the United States.

Dramatizing Economic Importance of Lakes Area, Show Is Based Upon Romance of Iron, Steel

In this great crescent-shaped area lie thousands of industrial enterprises which exert a tremendous influence upon the economic life of America. But whatever the character of industrial activity—whether it be the manufacture of automobiles, refrigerators, typewriters, washing machines, airplanes, machine tools, electrical equipment, locomotives or powerboats—the choice of location in most cases was dictated by the proximity of numerous sources of supply for that master material—steel.

In turn, the reason why steel is so readily available in the Great Lakes crescent is that in this area the important ingredients of iron ore, fuel and fluxing materials meet on advantageous terms. Consequently—and appropriately—the Great Lakes exposition is primarily an exposition of the potency of these ingredients. The dominant theme of the entire show is built around the romance of iron and steel.

Therefore it is not surprising that influential iron and steel and collateral manufacturing interests are participating more enthusiastically in this event than in numerous other national and regional expositions. This is one of the few instances in which industry has considered seriously the advantages of acquainting the general public with the economic importance of its activities.

In the Cleveland show the commercial exhibits of the iron, steel and metalworking industries, including a generous representation of the automotive branch, are supplementary to an educational, non-commercial exhibit entitled "The Romance of Iron and Steel." This probably is the most elaborate effort of its kind to show the man in the street the principal operations involved in the process of converting ore, fuel and auxiliary materials into finished steel. As an educational feature, it is far ahead of anything that has been offered at previous expositions. Unquestionably it will help the layman to appreciate better the technique of steelmaking. To that extent it has high educational values.

Industry, in Future Shows, May Well Stress Improved Working Conditions, Safety, Etc.

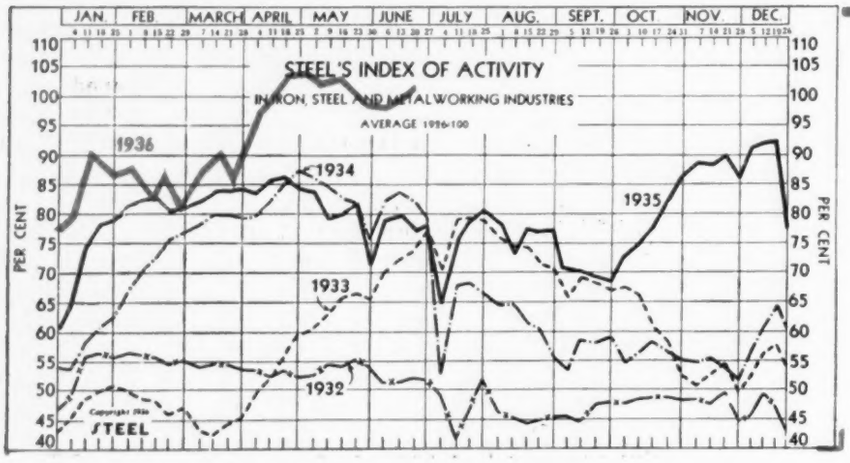
But we believe that industry generally, and particularly the iron and steel division of industry, has opportunities that have been touched upon only lightly at the Cleveland exposition. It is highly advantageous to acquaint the layman with the processes of production and manufacture. But beyond that is an opportunity for industry to give the public information concerning the human side of its activities.

The average citizen has been given the impression that industry is a merciless slave driver and that its employes are ground down by the requirements of a ruthless, mechanical Frankenstein. Would it not be feasible, in future expositions and particularly in the great New York exposition of 1939, for the iron and steel industry to put on a pageant or other demonstration to show the public the truth about working conditions?

If the man in the street could be shown that mechanical aids have reduced many of the old back-breaking jobs to tasks requiring only moderate physical exertion, he would gain an entirely different conception of employment conditions. Data showing the truth about health and injury hazards in industry also would help to explode another fallacy in the public mind.

Here are wonderful opportunities for constructive educational effort. We hope that the Great Lakes exposition may be an experimental laboratory in which industry will find new ways to win the understanding and favor of the public.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained 1.5 points to 100.9 in the week ending June 20:*

Week ending	1936	1935	1934	1933
Apr. 11	99.6	85.4	82.2	52.6
Apr. 18	103.1	86.3	85.0	55.8
Apr. 25	103.6	84.9	87.5	59.5
May 2	103.2	84.6	86.0	60.3
May 9	103.0	79.3	84.4	62.5
May 16	103.1	80.5	82.4	65.2
May 23	100.4	82.8	81.9	66.1
May 30	98.6	71.9	75.7	65.3
June 6	98.8	79.3	82.3	69.9
June 13	99.4†	80.0	83.6	72.1
June 20	100.9*	77.3	81.8	73.9

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

June Spurt Gives 1936 15.3% Lead over 1935 at Half

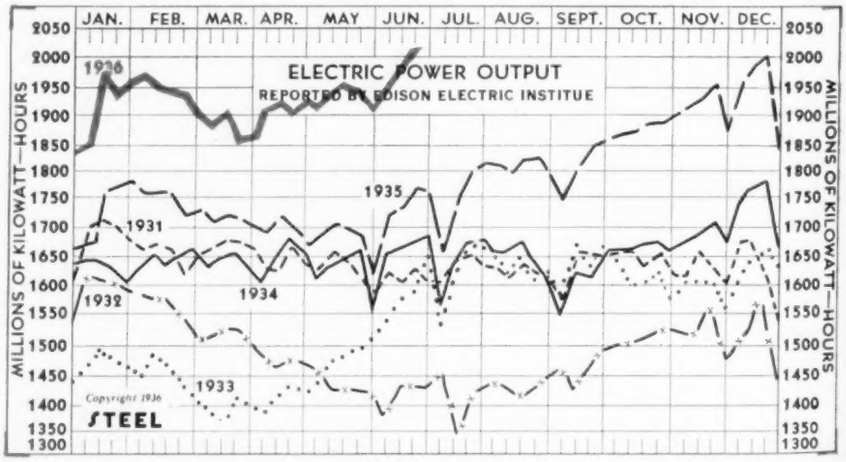
JUNE 30 will bring to a close one of the most remarkable quarters in the recovery period. It embraced two spurts in industrial activity —a natural and expected seasonal expansion in April and a secondary and contraseasonal upturn in June. Yet in spite these fluctuations, the volume of production was marked by unusual stability. The sustained strength extending throughout the three-month period made it the best quarter since 1929.

The whirlwind finish in June not only served to lift the second quarter into an honor position but it also helped to bolster the record for the first half of 1936. A month ago we figured that STEEL's index of industrial activity for the first five months of 1936 was running 12.7 per cent ahead of the corresponding period of 1935. Today, within a few days of the end of June, it is apparent that the average of the index for the entire first half will be 15.3 per cent in excess of the corresponding average for last year.

Comparisons of the records of individual products are even more impressive. Production of steel ingots for six months of 1936 will be about 33 per cent ahead of that for the first half of 1935. Output of pig iron will be at least 38 per cent greater.

The contrast in equipment orders is almost spectacular. The index for machine tool orders for five months of the present year averages 77 per cent higher than for the same period last year. Similarly the index of orders for foundry equipment is 46 per cent higher. The most striking gain is in awards of railroad freight cars. From January to May inclusive, 1935, only 1182

	Millions Kw.-Hrs.			
	1936	1935	1934	1933
June 20	2005	1774	1674	1598
June 13	1989	1742	1665	1578
June 6	1945	1724	1654	1541
May 30	1922	1628	1575	1461
May 23	1954	1696	1654	1493
May 16	1961	1700	1649	1483
May 9	1947	1701	1643	1468
May 2	1928	1998	1632	1436
April 25	1932	1673	1669	1428
April 18	1914	1701	1673	1431
April 11	1933	1725	1642	1409
April 4	1916	1700	1616	1399
March 28	1867	1712	1665	1402
March 21	1862	1724	1658	1409



cars were awarded, but in the same months of 1936 awards totaled 22,909. This represents a gain of 1838 per cent.

Improvement in foreign trade also is reflected in the comparison of merchandise exports, which shows a gain for the five-month period of 13.5 per cent. Automobile output, which wields such an important influence upon general industrial activity, will show a gain of about 13 per cent for the first half.

From these several comparisons it is apparent that industry is making a record which thus far in 1936 is running comfortably ahead of the 10 per cent gain predicted by so many forecasters at the beginning of the year.

The strength of the current situation is clearly indicated by the reports for the week ending June 20. Electric power output touched 2,005,243,000 kilowatt-hours, a new all-time record. Had this occurred in the normally high power winter months it would have been considered a remarkable achievement. It is phenomenal for such a total to be recorded in a week which includes some of the days of longest daylight in the year.

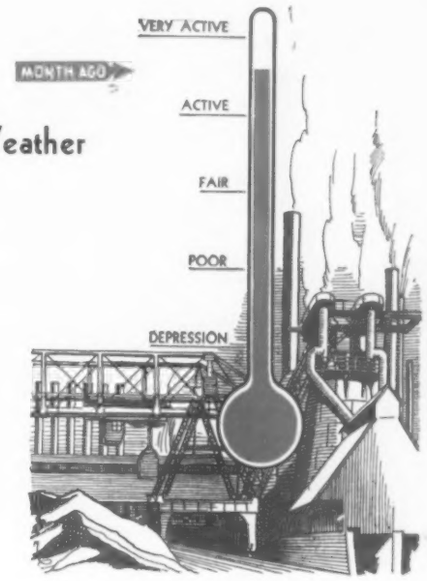
Revenue freight car loadings continue at around 685,000 cars weekly. The rate of steelworks operations is tending upward. Automobile assemblies, reflecting the purchasing by veterans, shows a slight gain after an orderly decline extending through five weeks. As a result, STEEL's index stands at 100.9, a gain of 1.5.

Where Business Stands

Monthly Averages, 1935 = 100

	May 1936	April 1936	May 1935
Steel Ingot Output	144.8	141.1	90.7
Pig Iron Output	149.1	139.4	96.5
Freight Movement	110.5	104.9	95.4
Building Construction	173.4	178.8	106.2
Automobile Output	137.9	151.4	109.5
Wholesale Prices	97.4	98.2	99.1

Industrial Weather



TREND:
Steady

The Barometer of Business

Industrial Indicators

	May, 1936	April, 1936	May, 1935
Pig iron output (daily average, tons)	85,795	80,316	55,986
Machine tool index	116.6	114.4	67.1
Finished steel shipments	984,097	979,907	598,915
Ingot output (daily average, tons)	155,625	151,625	97,543
Dodge building awards in 37 states (sq. ft.)	36,362,700	37,490,200	22,276,200
Automobile output	480,571	527,726	381,809
Coal output, tons	28,678,000	30,318,000	26,849,000
Business failures; number	832	830	1,027
Business failures; liabilities	$15,375,000	$14,543,000	$15,669,627
Cement production (bbls.)	.....	8,519,000	8,222,000
Cotton consumption, bales	530,000	576,672	469,250
Car loadings (weekly av.)	670,360	636,211	578,055

Financial Indicators

	May, 1936	April, 1936	May, 1935
25 Industrial stocks	$201.23	$201.98	$155.20
25 Rail stocks	$35.24	$36.41	$24.18
40 Bonds	$86.25	$86.59	$80.77
Bank clearings (000 omitted)	$22,473,000	$24,711,000	$23,103,000
Commercial paper rate (New York, per cent)	¾	¾	1
*Commercial loans (000 omitted)	$8,626,000	$8,343,000	$7,612,000
Federal Reserve ratio, per cent	78.5	78.3	73.3
Railroad earnings	**$41,547,644	$35,205,513	$34,625,786
Stock sales, New York stock exchange	20,614,690	39,616,438	30,438,423
Bond sales, par value	$201,974,000	$235,664,800	$285,404,900

*Leading member banks Federal Reserve System.
**April, March and April respectively.

Foreign Trade

	May, 1936	April, 1935	May, 1935
Exports	$201,042,000	$193,490,000	$165,459,000
Imports	$191,110,000	$202,437	$170,533,000
Gold exports	$5,000	$51,000	$49,000
Gold imports	$169,957,000	$28,106,000	$140,065,000

Commodity Prices

	May, 1936	April, 1936	May, 1935
STEEL's composite average of 25 iron and steel prices	$32.92	$33.10	$32.35
Bradstreet's index	$9.73	$9.81	$9.90
Wheat, cash (bushel)	$1.07	$1.12	$1.06
Corn, cash (bushel)	79c	81c	$1.04
Petroleum, crude (bbl.)	.....	$1.08	98c

Final finish machining operation on bearing surface of motor housing head insures a tight fit

Sealed-in Design Air Conditioning

BY E. C. KREUTZBERG
Engineering Editor, STEEL

AN UNUSUAL story of machine redesigning to meet the needs of the sales department has been unfolded in the development of a new air conditioning condensing unit just placed in production at the East Springfield, Mass., works of the Westinghouse Electric & Mfg. Co.

About a year ago the company's air conditioning sales organization at Mansfield, O., conveyed to the design and production executives at East Springfield certain findings with respect to actual service needs. The sales department asked for a smaller and more compact unit which might be installed more easily; one which would require no ventilation, one in which all mechanical parts would be easily accessible, and interchangeable to facilitate repairs and replacements; and one which would have eye-appeal. In particular, a unit was wanted which would be practically trouble-proof and one that would hold the refrigerant securely without the possibility of loss by leakage.

Unit Completely Enclosed

The result of subsequent study and development work in connection with this entire problem is a new air conditioning condensing unit which differs from its predecessor in no less than 17 features. Of major significance is the fact that the new unit is completely and hermetically enclosed. This design includes the motor as well as all other parts, so that no seal or stuffing box is required. The new unit is lighter, smaller for given capacity, and much more efficient than its predecessor, so that it is expected by Westinghouse engineers materially to hasten the general adoption of air conditioning.

At the start of the investigation which resulted in this new unit, it was revealed that a large percentage of all condensing unit troubles was due to leakage of the refrigerant at the shaft seal through which the driving shaft entered the compressor. Although surfaces could be perfectly machined and fitted at the factory, it was found that this was not sufficient. Leakage of refrigerant at the shaft seal in practically all cases was found to result from damage to the seal surfaces after the machines had been installed. This problem was of particular importance due to the fact that, to obtain a safe air conditioning system, it was necessary to use a much more expensive refrigerant than those used for commercial or domestic refrigeration. Too, the quantity of refrigerant in an air conditioning system is many times greater than that used in a domestic refrigerator. In fact, the cost of the refrigerant in some of the larger air conditioning systems comes to several hundred dollars. Hence, leakage of refrigerant was regarded as a problem of basic importance and, after careful attention, it was decided that the best solution would be to follow the practice developed in connection with domestic refrigerators —that is, by putting the motor and compressor inside a common housing and thus eliminating the shaft seal entirely.

Auto Engine Studied

For installations requiring the use of direct current the company will continue to use the open type with a seal, because the commutator cannot be enclosed in the refrigerant gas. The enclosed design, however, will be applied to all units for use on alternating current, which constitute, it is estimated, about 95 per cent of the current installations.

It is of interest to note that a thorough study of the modern, high-speed automobile engine was included in the campaign which resulted in the development of the new condensing unit. The purpose was to ascertain definitely why it is that to-

FOR data in the accompanying article STEEL *is indebted to the following members of Westinghouse Electric & Mfg. Co. organization: L. E. Osborne, manager, East Springfield works, East Springfield, Mass.; E. R. Wolfert, division manager air conditioning engineering, East Springfield works. R. E. Imhoff, manager of merchandising, Mansfield, O.; Sheldon F. Myers, manager air conditioning sales, Mansfield, O.; and Hendley N. Blackmon, manager technical press service, Pittsburgh. Acknowledgment also is made to Robert A. Kroeschell, Kroeschell Engineering Co., Chicago.*

Feature of New Condensing Unit

Leakproof surfaces of cylinder heads are obtained by a fine, finish grind in this operation

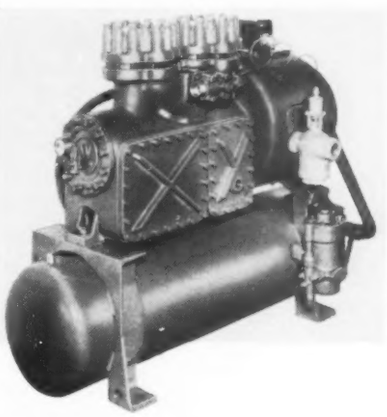
day's automobile engines, operating at speeds as high as 4000 revolutions per minute, have a much longer life than older automobile engines which operated at considerably slower speeds. The longer life, it was found, resulted from improved lubrication, the use of improved materials, improved workmanship and the enclosing of all parts. These major factors were borne in mind in developing the new condenser which, through operating at a speed not exceeding 1160 revolutions per minute must have a useful life considerably longer than that of an automobile engine.

Condenser Parts Interchangeable

After arriving at an agreement as to the requirements for a good condensing machine, engineers next gave their attention to the problem of building the machine in desirable sizes and at reasonable cost. Since the number of machines of this kind now demanded by the air conditioning industry does not at all compare with the distribution of many modern units which are produced by so-called volume production methods, it was decided that the condensing units should be built with as many common parts as possible. It also was decided to use as many as possible of the old parts which had proved satisfactory in service in the past and for which the plant was already tooled. This procedure was regarded as desirable because it would tend to get the new machines out of the experimental stage to that extent and it also would keep down tooling expense and engineering cost.

Three popular sizes were selected and compressors designed for 2, 4 and 6 cylinders, respectively, driven by 7½, 15 and 25-horsepower motors. These machines all use the same end bearings, pistons, piston rings, connecting rods, wrist pins, center bearings, cylinder heads, side covers, valves, oil pump and various condenser parts. The only major parts of the three machines which vary are the crankcase, crankshaft, motor and condenser. Even the crankcase and condenser are so designed that the same tools can be used to produce all three sizes. Much thought and effort went into this matter of parts design, since the development of common parts not only cuts the manufacturing costs but also makes it easier to service condensing units in the field.

One of the important features of the new condensing unit is that whereas the condenser and compressor only had been water cooled, the motor now also is water cooled. This cooling is effected by means of a water jacket around the motor, within the motor housing, through which water circulates constantly. Oil going through the lubricating system also is cooled by this water jacket thus serving to cool the entire operating mechanism. Another important feature is that the motor is direct connected to the compressor, eliminating the use of couplings. The rotor of the motor is overhung on a thick, stubby, stiff shaft so that there is no out-bearing to line up.



Four-cylinder totally enclosed and hermetically sealed air conditioning condensing unit

Single Casting Houses Unit

A single, intricate, nickel-iron casting is the chassis for the new unit. In this are cast integrally the cylinders, crankcase, intake and exhaust manifolds, and cooling jacket. In fact, the purpose was to make this basic casting do as much of the work as possible. Hence, despite the enclosing of the motor, the gasketed area and the length of the gaskets have been reduced materially. By casting the refrigerant openings and passageways in the crankcase much piping is eliminated. The discharge line to the condenser is the only real piping outside the normal liquid line connection to the strainer. Where there were 13 brazed joints in the old unit, there are three in the new one.

In the new unit the oil pump, of considerably increased capacity, is direct driven from the main crankshaft by a noiseless Micarta gear.

The pump is simple, consisting only of two rotating gears which pump the oil from the reservoir, strain it through a fine mesh metal screen and deliver it through rifle-drilled passages in the crankshaft and connecting rods to all bearing surfaces. Oil pumped with the refrigerant is removed by a simple oil separator with no moving parts, is strained and returned to the oil reservoir for recirculation.

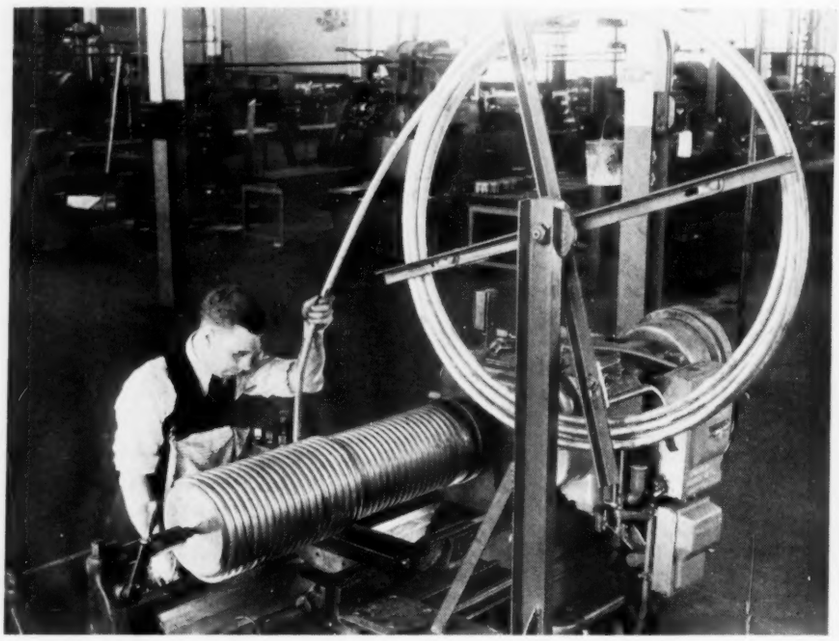
Parallel Oil Feed Used

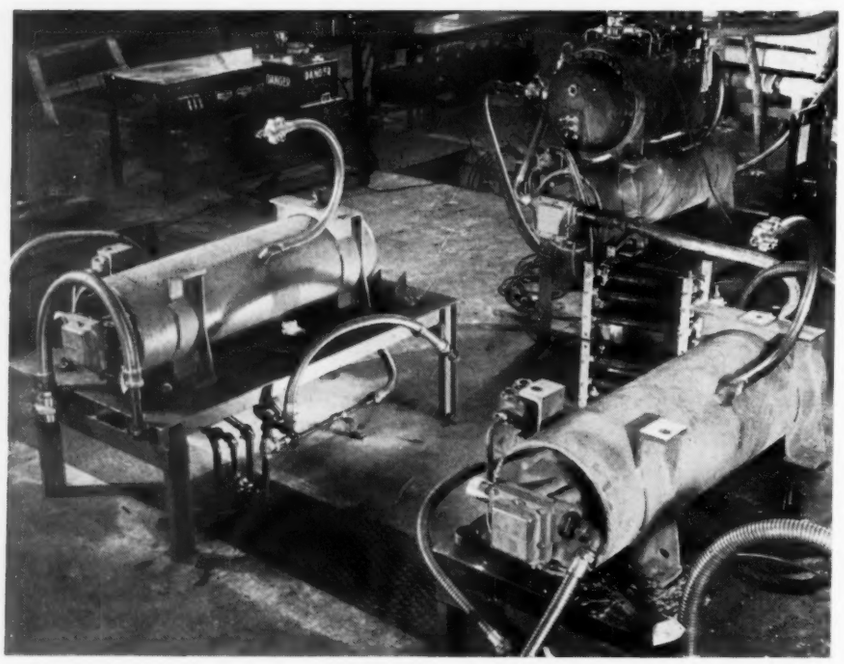
The new design uses parallel feed of oil to the bearings rather than series feed. Formerly the oil had to flow through the crankshaft some distance before it reached the main bearing. In the new design oil from the pump is piped directly to each main bearing where it is distributed to the nearest connecting rods through the holes in the crankshaft. The design, it is claimed, will obviate the necessity of ever having to oil the unit in service. The oil pump can be removed easily by loosening bolts in the end bearings and rotating so that it will come out the side of the crankcase. Sides of the crankcase, incidentally, are covered by removable plates, thus making all of the mechanism easily accessible. In the 4-cylinder model, the oil pump has bronze bearings since the pump carries a harmonic balancer.

While of the same general design as in previous machines, the valves have been improved in several respects. The port areas have been increased considerably, allowing easier and less restricted passageways for the gas. The method of aligning the plates has been improved. A small pin is used to align the two halves, shown in an accompanying illustration. A hole is drilled in the cylinder head so that a small projection of the pin fits into the hole. Thus it is impossible to assemble the valves into the compressor head upside down or wrongside to.

Cylinder design is such that the machine is inherently balanced as far as primary forces, those that tend to vibrate the machine with the same frequency as the speed of rotation, are concerned. However, there is a secondary force that tends to lift the machine off its base twice for each revolution and to counteract this force two small rotating weights are so placed that they combine to keep the machine down when the lifting force is exerted. These weights rotate in opposite directions and at twice crankshaft speed.

The condenser used is of the shell and coil type, with the water through the coil similar to previous designs except for one marked difference. The design offers choice of two different pressure drops through the condenser coils for the same water flow, by means of a water manifold cover external to the condenser. These covers are shipped for ordinary city water pressures of 35 pounds per square inch or higher and in this connection the water flows through the two coils in series. If it is desired that more water pass through the condenser for the same water pressure, the two coils can be placed in parallel merely by removing the cover, dropping out a thin plate and replacing the cover. The pressure drop then will be approximately one-eighth that of the series connection.





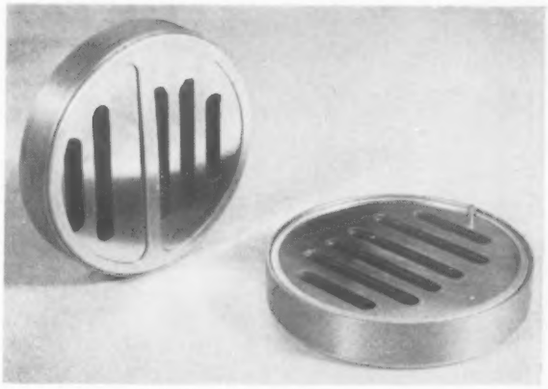
COPPER and steel condensers (left) awaiting assembly to compressors, assembled unit being shown in background. Above, an operator is winding copper tubing for condenser. Mandrel with surface corresponding to that of the inside surface of the coil and a shoe with semicircular face, mounted suitably in the lathe, assist in producing accurate coils

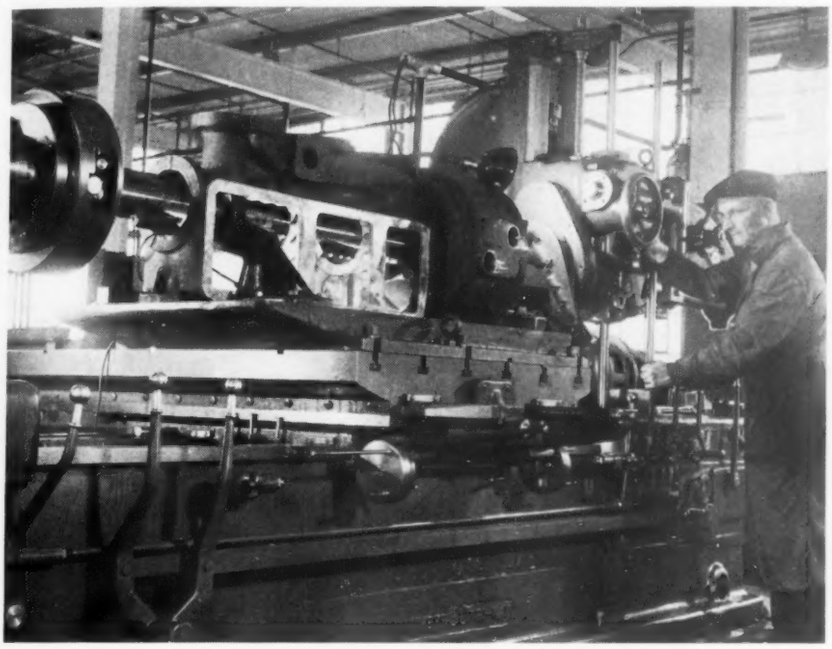
In addition to this feature, the condensers are built with copper tube coils and cast steel housing and manifold. The company hopes later to have a shell and tube type of condenser which will be optional at a slight additional cost. To date it has

had difficulty in developing a shell and tube type of condenser which will be small, mechanically strong and at the same time quiet. The new unit is equipped with a pilot operated water regulating valve which is more rugged in that the power element consists of a bellows instead of a diaphragm.

Since the new unit has a water-cooled motor, it is believed that the machine can be placed where there is little or no ventilation. Preliminary tests show that the unit can be completely boxed up and operated with safety. This means that the units can be located almost anywhere. In fact they can be located out-of-doors if proper precautions are taken to seal the motor terminals against moisture for electrical reasons.

VALVE assembly (right) showing pin on part at the right which fits into a small hole drilled in cylinder head for accurate setting. Inner aluminum ring, backed by a steel band, serves as gasket. Below is shown boring operation in crankcase for bearing supports





A good measure of the changes made by redesigning is afforded by a comparison between the new 4-cylinder design against the 6-cylinder former design which had comparable cooling capacity. The new 4-cylinder design weighs 1600 pounds, is 54 inches long, 26 inches wide and 40 inches high; it operates at 1160 revolutions per minute, with 15 rated horsepower, and has capacity for 156,000 B.t.u. per hour. The former 6-cylinder design weighed 3400 pounds, was 76¾ inches long, 30⅞ inches wide and 43¼ inches high; it operated at 870 revolutions per minute, with 20 rated horsepower, and had cooling capacity of 165,000 B.t.u. per hour.

The company has evolved an improved sight gage which is leak-proof in connection with refrigerants which are hard to hold. The sight gage is of a heat resisting glass and the bushing which prevents the escape of the refrigerant is of Metalastic packing, a compound of antimony, graphite and asbestos. These sight gage "bull's eyes" make it possible to check the oil level, the rotation of the motor and whether the refrigerant is in the gaseous or liquid condition.

Approximately $500,000 is in process of being spent on the production line for manufacturing the new condensing units. The line is in a 1-story building with saw-tooth roof, and the lay-out is the straight-line production type, with ample space for expansion in capacity which the company believes will be necessitated in the near future by the increasing adoption of air conditioning.

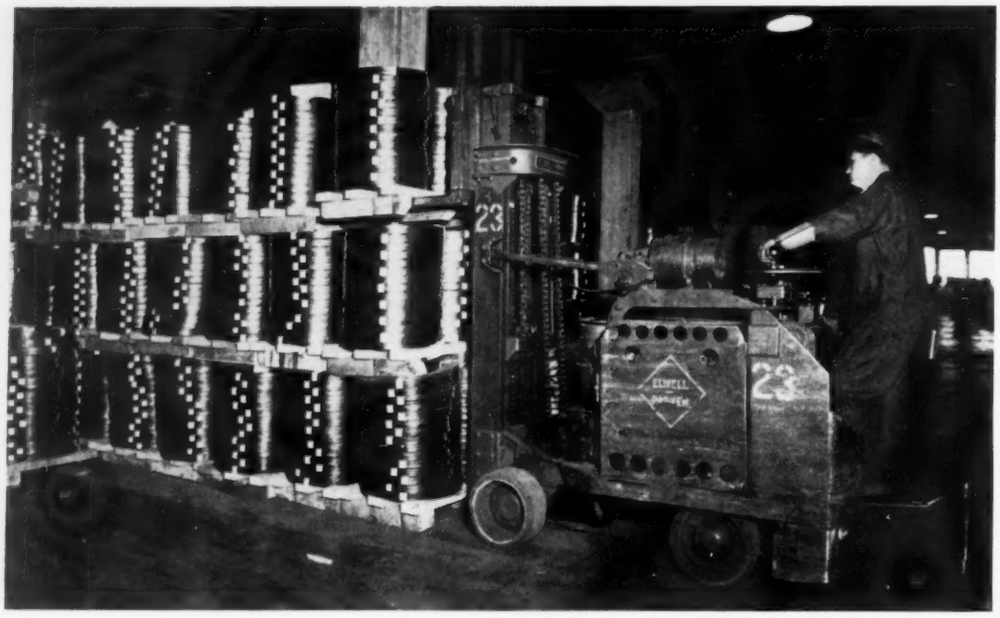
Because of the importance of the basic casting in the new unit, careful attention has been given to the production of satisfactory castings. The integral crankcase casting is cast inverted from its normal position to obtain the best metal possible for the cylinder bores. A number of risers are employed to make sure that the casting throughout will be solid. The basic requirement is that the entire casting be entirely tight to prevent any leakage of refrigerant.

Manufacturing Process Simple

Because so many parts are produced integrally in this casting, the general manufacturing process is simpler than otherwise would be possible. The tooling scheme consists of using the compressor feet and mounting holes as the locating points for all machining operations. The compressor is designed with a 3-point suspension so as to avoid the use of shims and the need for accurate machining of the supports. The feet are first placed with reference to the unmachined crankshaft bearing supports and motor housing. Then, the holes in the feet, which afterward are used as mounting holes, are accurately drilled by means of a jig. The jig locates the holes in the feet from the rough cylinder bore and the bearing supports. After the planing and foot drilling operations, all other jigs and fixtures for further machining the crankcase locate from these holes in the feet.

The cylinder bores are next finished, first using a roughing-out boring tool, then a finish boring tool and then the bores are finished by honing. This is accomplished by beams of a V-track fixture using three vertical mills. A stop at the lower left hand corner of the fixture fixes the distance between cylinders with sufficient accuracy to match up with the crankshaft throws. The crankcase then is bored for the main bearings; the same operation faces off both ends and bores the motor housing for the motor stator. This boring operation is performed on a horizontal boring mill by means of a 4-inch diameter boring bar supported by an outboard bearing. The fixture used again locates from the holes in the feet. The drilling and tapping for the side covers, bearings

(Please turn to Page 61)



Fork and pallet type truck tiering coiled steel in storage before shipment

Handling Coiled Steel in Warehouse Simplified by Using Lift-Fork Trucks

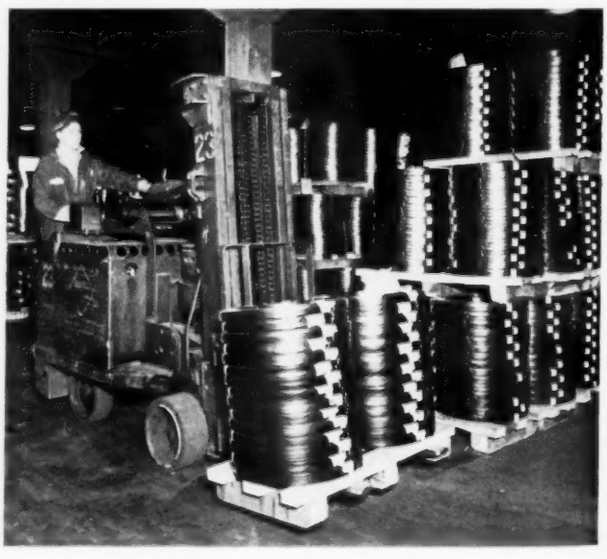
OFFICIALS of Acme Steel Co., Chicago, believe they have effectively solved a difficult problem in materials handling with the installation of a number of lift-fork type electric trucks. The problem involved transferring heavy loads of coiled strip steel from the coilers to the warehouse for storage and from storage to the loading dock and into box cars.

The system formerly used was hand stacking from a lift-platform, which entailed four handlings of each coil in the transference from the coiler to the car. In order to reduce the labor cost of these handlings, the company recently purchased a number of lift-fork type trucks manufactured by the Elwell-Parker Electric Co., Cleveland. Loads are handled by these trucks on inexpensive wooden pallets which can be tiered to the roof in the warehouse and to the limit of weight in a box car.

The trucks are in service on an average of 18 to 20 hours a day, with loads averaging from 2750 to 4000 pounds. Length of the hauls runs anywhere from 50 to 400 feet, with a safe average being 250 feet, and since much of the hauling is not straight-line work, the trucks must be flexible enough to meet this condition.

Installation of the fork-and-pallet system of handling has reduced the number of individual handlings to one. The coils are stacked on a wooden pallet as they come out of the coiler, and from that point the units handled are the pallets with their loads of about 30 coils rather than the coils individually. These pallets are made inexpensively from six heavy wooden members, three to support the coils and three to act as skids at right angles to the others. The trucks are equipped with steel forks which slip under the pallets and raise the load to the desired position. After the load is on the fork, a backward tilt of 15 degrees insures a more stable position of the weight. An upward lift of 105 inches is provided for stacking the loads.

The trucks are electrically powered, and each truck is furnished with two sets of storage batteries, one of which is being charged while the other is in service. The rated capacity of the trucks is 75,000 inch-



STRIP from the coilers is carried to the warehouse and tiered by the lift-fork trucks, requiring only one handling

pounds with a 5000-pound load, and the speed of travel is up to 5.5 miles per hour depending on the battery voltage selected. Transmissions are equipped with three speeds forward and three reverse. Steering is done by means of a handwheel and a gear reduction device, which will turn the truck on a 73-inch radius. Wheels are four in number, two of which drive, and the other two in the rear steer. They are equipped with solid rubber tires. The floors over which the trucks operate are concrete. The company maintains a repair shop which gives each truck a weekly check-up.

Flexibility of trucks permits placing each load exactly where it is wanted, especially in the loading of cars. The first pallet may be set squarely in the corner with succeeding ones exactly at the side and in front with as much ease as if done by hand. Acme Steel Co. originated the idea of inexpensive pallets (for coiled stock) which are shipped with the load, thus saving the labor cost in unloading skids by hand. Thus both the shipper and receiver effect a saving in time and labor.

TRUCKS load and unload boxcars without additional handling, tiering the load in any position desired

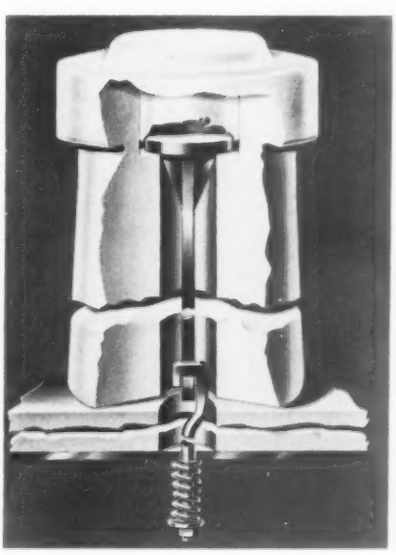
Chromium-Nickel Steel Anchors Used In Casting 200-Inch Telescope Disk

ANCHORS made from chromium-nickel steel played an important part in the successful production of the second 200-inch telescope disk in the plant of the Corning Glass Works, Corning, N. Y. Although little heard of, these anchors, which contained approximately 25 per cent chromium and 10 per cent nickel, performed the essential function of effectively tying down the 114 ceramic cores of the mold.

In an article appearing in the July issue of the *Electromet Review* published by the Electro Metallurgical Co., New York, it is stated that the importance of these anchors can be appreciated when it recalled that during the casting of the original 200-inch reflector, the extremely high temperature of the glass caused certain cores to rise in the molten disk through failure of another type of core support.

That the mirror might weigh as little as possible and still possess the necessary rigidity to maintain its figure of curvature to a millionth part of an inch, the disk was ribbed for the major portion of its thickness. The remaining thickness provided stock into which could be ground and polished the paraboloidal surface required of a mirror in a reflecting telescope.

The mold to form the geometric pattern of hollows in the back of this ribbed glass object required 114 cores varying in height from 16 to 20 inches. These cores of lightweight insulating brick material when immersed in 26 inches of molten glass tend to become buoyed up like corks in water with a force of approximately 80 pounds for each cubic foot of volume. To hold the cores in place against the mold bottom was the purpose of the chromium-nickel steel anchors.



Refractory cores were held in place against the telescope disk mold bottom by chromium-nickel steel anchors of the type shown here

Each anchor resembled somewhat an automobile valve, with a stem of rectangular section and a circular flange at the top, as shown in the accompanying illustration. A hook engaged the lower end of the stem and completed the connection with the bedplate of the mold below. The circular flange at the top of each anchor had a sectional area of slightly more than 1 square inch and was designed to carry a load of 300 pounds safely without appreciable creep or stretch for a period of two weeks at a temperature of 1525 degrees Fahr.

Anchors Red Hot for Months

In addition to the stresses induced in the anchors from the buoying effect of the cores, one has only to consider the length of time of the annealing operation at which these anchors were subjected to red-heat temperatures. The mold was first heated to approximately 1800 degrees Fahr., and 6 hours were required to pour 20 tons of molten glass at a temperature slightly less than 2800 degrees Fahr. The mold and its contents were then held at 2400 degrees Fahr. for 10 hours, followed by slow cooling to a dull red heat of 1200 degrees Fahr. Finally the whole was placed in an annealing oven and allowed to cool only a few degrees a day for 11 months.

In spite of these severe conditions,

the chromium-nickel steel anchors, when removed from the mold, were without discoloration and still of original dimensions.

Acetylene Group Meets in London

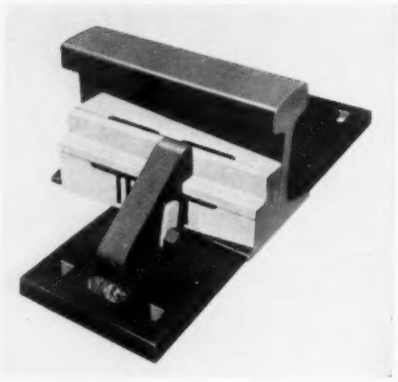
MORE than 30 technical papers and 35 moving picture films were presented at the Twelfth International Congress of Acetylene, Oxyacetylene and Allied Industries held in London, June 8-13, under auspices of the British Acetylene association. The congress was attended by visitors from many countries.

J. Donald Pollock and P. B. Liversidge, directors of the British Oxygen Co. Ltd., and president and vice president, respectively, of the British Acetylene association, presided at various sessions.

The British Acetylene association's gold medal for the best paper submitted in English by persons of British nationality was awarded jointly to C. G. Bainbridge and R. E. Dore for their paper "Application of Oxyacetylene Welding to the Resurfacing of Worn Crossings and Permanent Way Bonding on British Railways." The silver medal was presented to W. H. G. Hignett for his paper "Oxyacetylene Welding for the Chemical Industry."

Among the American contributions was a paper, "Alloying Elements in Welding Rods," by Dr. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York (see page 49).

Included in subjects discussed in the papers were: Historical survey of industrial oxygen production; risks of explosion of dissolved gas cylinders; modern oxyacetylene welding methods; X-ray testing of welds; weld structures; rail bonding and building up worn surfaces; shrinkage and stresses in welding; creep strength of autogenous welds; influence of welding methods on mechanical properties; weldability of steels; corrosion of welds in structural steel; low-temperature steel welding; practical teaching of oxyacetylene welding; underwater cutting; and deposits obtained by metal spraying.



Detail of the spring rail brace, showing the pawl disengaged, with the wedge in place between the rail and the combined switch plate and brace

Recovery from Side Thrusts Provided by New Rail Brace

Resiliency for full recovery from side thrusts is claimed for the new spring rail brace developed by Bethlehem Steel Co., Bethlehem, Pa. The brace, shown in the accompanying illustration, has a specially shaped wedge for one of its two principal members. An angular spring steel piece is welded to the wedge, and the resulting construction will withstand a pressure of 12,000 pounds before being closed against the stop.

The base is a rolled-steel switch plate on which the bracing member is securely welded. The bearing face of the brace is machined so as to make an inclined contact with the wedge, compressing the spring against the web and flange. This prevents the wedge vibrating loose. A pawl on the brace engages slots on the wedge, acting as a further safety device to prevent the wedge from working loose.

Radio Series Aimed at Purely Industrial Field

Making an appeal not only to the executive, but also to the man on the job, a new series of radio programs aimed solely at the industrial field made its debut recently from a Pittsburgh broadcasting station. The programs are arranged and staged by the transcription department of the National Broadcasting Co., New York, for the Duff-Norton Mfg. Co., Pittsburgh, maker of lifting jacks. Entertainment on the program is provided by Dick Liebert, organist, and Mlle. Rachel Carlay, prima donna of the Folies Bergere of Paris. James Wallington brings the commercial messages of Duff-Norton to listeners. The company recently distributed announcements of the programs, addressed to "Gentlemen of the railroads, oil fields, and American industry", as an aid in marketing the program.

Stainless Presidential Pantry

ENDURO stainless steel, manufactured by Republic Steel Corp., Cleveland, was used in this installation at the new White House kitchens. The equipment was fabricated by Tracy Mfg. Co., Pittsburgh, and installed by the Excel Metal Cabinet Co., Jamestown, N. Y.

Industrial Research as Done at Mellon Institute

Glances at Industrial Research, by Edward R. Weidlein and William A. Hamor; 246 pages, 5 x 7½ inches; published by Reinhold Publishing Corp., New York; supplied by STEEL, Cleveland, for $2.75, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London.

The purpose of this work is to tell of the contributory relationship of Mellon institute to recent industrial research progress and to present the industrial fellowship system of that institution as a productive force in technologic advancement.

It devotes particular attention to the late advances, present status and future opportunities of industrial research, as discerned at Mellon institute and includes chapters on subjects in industrial management accorded scientific study and development in the past five years.

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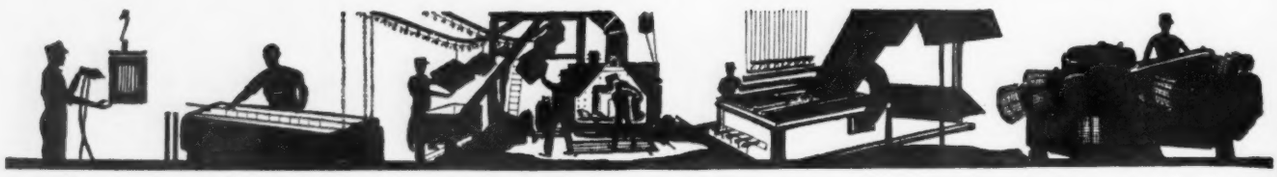

Corrosion Protection Value of Paint Films Indicated by Electrical Device

IN VIEW of the fact that none of the human senses can distinguish the corrosion-resisting finish from the one that is not, it becomes necessary, if time is limited, to resort to some kind of accelerated test method for evaluating effectiveness. If possible the test should simulate to some extent the conditions of actual usage. The fact that authorities have not agreed as yet on a standard procedure indicates the difficulties involved and explains why there is such a wide variety of testing procedure in use today. Some of the methods are appropriate while others are extreme in that the assumption is made that because a finish will resist weathering it is adaptable for service.

Four Factors Involved

As we are now to consider only the testing of finishes for the protection of metals from corrosion let us first consider some of the factors that are involved.

First is adhesion. If the coating, no matter how excellent, cannot adhere to the metal in question, it is of no further use. Adhesion of a given material varies widely with different metals and their alloys. The removal or retention of oxide films has an important bearing on adhesion as well.

The second essential is that the finish shall passivate, as much as possible, the reactive tendencies of the underlying metal with corrosive reagents. This requires the exclusion of moisture and gases as well as the inhibition of corrosive matter occluded by the finish when it is applied.

Third, the film must have resistance to stress and strain, corrosion, abrasion, impact and weathering.

The last requisite is that it have the proper decorative effect such as color, gloss, smoothness and the like.

Almost all metallic corrosion is electrolytic in character; that is, the setting up of electronic flow by potential differences inherent in dissimilar metals and alloys in the presence of an electrolyte. As water is the basis of the latter it is readily seen that its exclusion will prevent electrolysis.

Electrical Insulation Desirable

The prevalent practice of using the ground as a return conductor in the use and distribution of electric power makes much metal in service share the burden of carrying electricity. This results in a variety of electrolytic corrosive effects where no protective insulation is supplied.

The displacement of hydrogen from an acid solution on metal produces corrosion by releasing atomic hydrogen which, however, tends to build up a protective film that prevents further corrosion if not removed. If there is oxygen present, however, it will combine with the hydrogen and add more water to the solution and set in motion further corrosion by the release of more hydrogen. This cycle is limited only by the available supply of oxygen.

Metals, due to the fact that they are physical rather than chemical mixtures, are not homogeneous. Consequently dissimilar metals are found actually in juxtaposition in a supposedly homogeneous metal surface, particularly if it is an alloy. Incidentally, few pure metals are really available for commercial use. Here, then, is a fertile field for electrolytic disintegration in the average metal surface presented for protective finishing.

Tests Only Nonconducting Films

In tests to determine the corrosion-resisting quality of a finish, as usually made, account has to be taken of the corrosive effect on the metal itself as well as on the finish. There is a wide variation in the corrosion resistance of metals. The metal

APPARATUS for evaluating paint and lacquer films by the megohmeter method. The method of clamping one lead to the bare panel is as illustrated. The pointed lead is placed in a drop of water on the paint film

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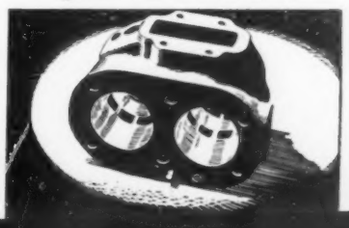
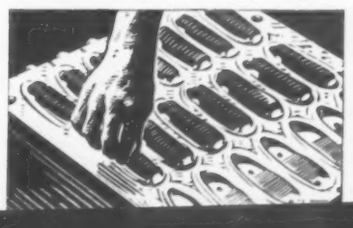


Life of molds, dies, tools greatly increased by chromium plating



Wide variety of products made better-looking, more durable

which rusts the least is not necessarily the best actor when coated. A primary (invisible) oxide has protective qualities under a finish while the secondary (rust) oxide has quite the opposite effect unless a finish is particularly formulated to make rust a part of itself. In other words, matter such as scale, rust, water, salt and other foreign materials between a metal and its protective film must be taken into consideration in any corrosion prevention test.

Bearing the above-mentioned factors in mind as well as the fact that we can deal only with nonconducting films, the following test for moisture-excluding effectiveness of organic finish films is offered, although no claim is made to unusual merit.

High Resistance Measured

The instrument, known as a megohmeter, is essentially a device for reading a wide range of electrical resistances. By means of a switch different ranges of resistance values are made available such as 1 to 1000 ohms, 1000 to 100,000 ohms up to thousands of megohms (1,000,000 ohms). Without this wide range of sensitivity the instrument is valueless. An instrument with a maximum sensitivity of 100,000 ohms would show two films to be equally good and tight when actually one is far superior to the other. This error would be due to the resistance of the poorer film being just over 100,000 ohms.

One of several applications of the instrument involves the use of a metal panel (type of metal immaterial) coated with a known thickness of paint to be tested. Connect one lead from the instrument to the metal of the panel; then after placing a drop of water on the paint start a stop-watch. The other lead point is put into the drop of water. When water, which is an electrical conductor, penetrates through the film the electric circuit will be closed thereby and the galvanometer deflection will indicate the fact. The time as shown by the watch divided by the film thickness in mils will serve as an excellent index of the corrosion-resisting ability of the paint film under test.

In addition, of course, it is necessary to test for physical and chemical resistance characteristics separately. Standard tests for these characteristics are all familiar.

STEEL is indebted to Alfred Hague & Co. Inc., 233 Thirty-seventh street, Brooklyn, N. Y., for the description and photograph of this device and theory of its use.

Dry Rectifier Supplies Current for Operating Electroplating Unit

INTEREST evinced in the use of rectifiers for electroplating purposes and active discussion which this subject aroused at the convention of the American Electro Platers' society in Cleveland, June 1-4, brought out the fact that rectifiers are being used successfully for electroplating in this country, although not as extensively as in England.

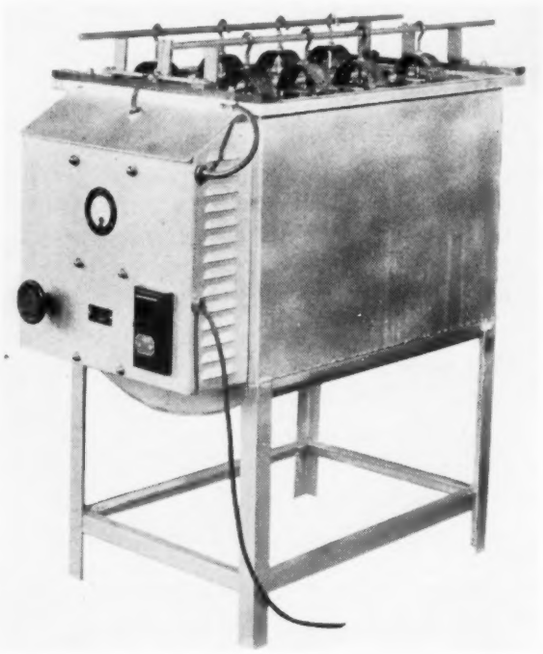
In this country, Circo Products Co., Cleveland, has adapted a rectifier to furnish the current to a tin plating unit which this company supplies to the automotive trade for plating pistons. The units are usually sold in sizes rated at 300 watts which will plate eight pistons at one time, using 60-cycle, 110-volt alternating current. Units rated at one kilowatt have been built, using single-phase alternating current. In all cases, however, both sides of the cycle are utilized. Larger installations use a 3-phase current but their use is not widespread. To date this company has not used rectifiers for anything except these tin plating units for the automotive industry.

The rectifier units are the copper sulphide type which requires no electrolyte. Approximately 12 volts is applied to the input side to deliver 6 volts at the tank. It has been found that the resistance of the rectifier units will increase with use until it is necessary to apply approximately 13 volts to deliver 6 volts. After this value has been reached, an equilibrium is apparently attained and no further voltage increases are required. The voltage changes are made by means of taps on the transformer primary. In tests the rectifiers have been overloaded until the transformers burned out and the connections fused without any apparent damage to the rectifier. If the rectifiers were punctured, self-healing properties are indicated, for they continue to function satisfactorily when the transformers and wiring were replaced.

No Anodes Required

The bath used in these units is of the alkali-sodium stannate type and is the sole supply of tin for the process. No tin anodes are used, since it has been found that replenishing the bath, as indicated by periodic analysis, has been sufficient. Under ordinary circumstances it has been found that such replenishment is necessary at approximately one-month intervals, since most installations are operated only intermittently. The manufacturer maintains an analysis and advisory service for all its units.

The manufacturer claims that maintainance and initial costs have been materially reduced since rectifiers were substituted for motor-generators in these units. In addition, it has been found that a brighter tin plate is obtained with the rectifier powered units than with those powered by motor-generators.



SIMPLICITY and compact, rugged design are illustrated in this rectifier-powered unit for tin-plating automotive pistons. The rectifier, transformer and electrical controls are all enclosed in the ventilated case on the end of the tank

Alloying Elements Improve Properties of Welding Rods

BY A. B. KINZEL
Union Carbide & Carbon Research Labratories Inc.

WHILE alloying elements have been used in both ferrous and nonferrous metallurgy for many years, it is significant that the development of their larger commercial use has been coincident with the development of the autogenous welding processes. The common factor has been a better understanding of high-temperature metallurgy.

In the early days of autogenous welding, material used as welding rod or filler metal was identical with that to be joined. It was not long, however, before it was realized that this simple rule did not suffice, that certain additional phenomena took place in the welding operation, and that these phenomena could be directly influenced by the presence of relatively small amounts of impurities or of alloying elements.

The first step in the direction of special welding rod in the ferrous field was the elimination, to as great a degree as commercially possible, of all alloying elements and impurities in the addition metal by the use of commercially pure iron. The filler metal which best meets this requirement and which was available even in the early days of welding is "Swedish" or "Norway" iron containing no more than 0.06 per cent carbon, with manganese below 0.20 per cent, phosphorus below 0.020 per cent, and sulphur below 0.030 per cent, all other elements being absent or present only as traces.

Base for Special Rods

On deposition, some of the carbon and manganese is lost by oxidation, the carbon being reduced to about 0.03 per cent, and the manganese to about 0.07 per cent. The phosphorus and sulphur remain about the same. This has long constituted the iron base on which other welding rods with special characteristics have been designed, and gives such excellent ductility in the deposited metal that it is still utilized to a very large extent.

Great care must be exercised in welding to prevent too much oxidation of the iron. The sparking which takes place during the operation damages the scarf, and the soundness of the deposited metal depends in a large measure on the ability of the welder to puddle it in such a way as to minimize the presence of slag inclusions in the weld proper.

The disadvantages of the iron rod indicated in the foregoing paragraphs were sufficient to stimulate thought and experimentation. The major improvement of the last decade resulted in the steel welding rod and consisted in the addition of carbon and deoxidizing materials whose oxidation products were self-fluxing. This story has been told on many an occasion, so that at this point it is only necessary to summarize with the statement that silicon is the prime deoxidizer for use in steel welding rods, and manganese combined with the silicon in proper proportion results in self-fluxing inclusions and slag coverings of the desired viscosity.

THE accompanying article constitutes a portion of a paper presented at the Twelfth International Congress of Acetylene, Oxyacetylene Welding and Allied Industries in London, June 8-13. The author, Dr. A. B. Kinzel, is chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

The presence of these deoxidizers allows an increase in the carbon content to a range from 0.15 per cent to 0.20 per cent. The presence of the manganese and the silicon also allows greater leeway with respect to phosphorus and sulphur. The melting range of the rod is reduced some 50 degrees Fahr. and the flowing characteristics greatly improved. The addition of some 0.5 per cent silicon and 1.0 per cent manganese may well be considered as the major alloy improvement in steel welding rods and indeed these additions in modified quantities but following the same principle will be found in most modern complex alloy steel welding rods and may be considered as basic.

The silico-manganese rods result in deposited metal with the full strength of the steel plate — up to 70,000 pounds per square inch, and with ductility of more than 15 per cent elongation on free bend tests. Attempts at other alloy combinations to achieve the same results in the 70,000 pounds per square inch tensile range welding rod have been made. The use of nickel instead of manganese is moderately successful. The use of vanadium as an additional deoxidizer makes it difficult to get a slag covering of the desired viscosity. Zirconium is a promising element in this respect, in that it combines readily with oxygen, nitrogen and sulphur, and the reaction products are readily fluxed. In this tensile range, the silico-manganese combination is in greatest favor, being as yet unsurpassed in welding quality and representing the most economical of the alloying possibilities.

When higher strength in the deposited metal is desired, the addition of strong carbide formers to the silico-manganese base has given successful results. The use of chromium or molybdenum in quantities approximating 0.5 per cent has resulted in a welding rod giving a tensile strength of 100,000 pounds per square inch with reasonable ductility. In general, it has been necessary to maintain the silicon at its base level in order to have sufficient protection against oxidation of the carbide-forming element, and in order to maintain the proper slag viscosity it has been necessary to further increase the manganese content.

Alloys for Hardness

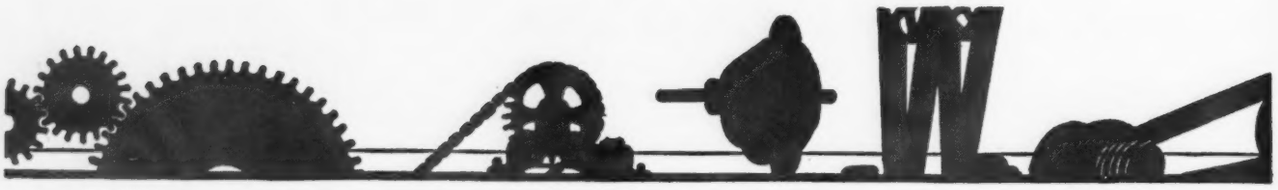
To obtain hardness for wear resistance, surface deposition of hard-facing rods is used. These rods are again a matter of alloy addition. The well-known 1.5 per cent chromium rod for building up rail ends and the well-known 1 per cent chromium and 0.25 per cent molybdenum rod for general-purpose hard-facing are illustrative. The use of the oxyacetylene flame with these rods allows of controlled hardness over wide limits by means of controlled carbon pickup from an excess acetylene flame.

It is interesting to note that even when large amounts of alloying additions are involved, such as for example, the stainless steel type or the 8 per cent chromium and 4 per cent manganese type of hard-facing material, the basic principles remain the same — always enough silicon to protect the metal proper, together with enough manganese to give suitable slag viscosity, and with chromium carbide as the essential strengthener and hardener.

One of the most spectacular of recent achievements in alloy steel welding rods is the new stainless steel type, ensuring freedom from

(Please turn to Page 61)

Power Drives



Pulley Coverings

SOMETIMES belt slippage is considered as a fault of the belt. However, on short center drives the small pulley has a comparatively small amount of belt in contact with the pulley surface but is expected to do as much work as the much greater contact on the larger pulley. For example, with pulley ratios of 1 to 3 and center distances twice the diameter of the larger pulley (commonly considered good practice), the smaller pulley has not only much less than 180 degrees contact but has less than 25 per cent of the belt surface contact of the larger pulley.

Where the reduction ratio goes as high as 10 to 1, which is about the maximum practicable, the belt contacts only about 150 degrees on the small pulley; this is less than 7 per cent of the surface contact on the large pulley. Tests have shown that with the belt in contact with 150 degrees of the pulley surface it may be expected to transmit only 85 per cent of the power deliverable with 180 degrees contact.

Power transmitted, however, decreases rapidly with loss in tension and results in excessive slippage and burning. This loss mounts still more rapidly with smooth cast-iron pulleys but less rapidly with paper pulleys. Excessive slip soon will wear a paper pulley, however, and polishes the cast-iron pulley to a point where it has still less gripping power.

Coverings Stop Slippage

Many types of pulley coverings or laggings are available to give a better tractive service than obtainable from polished cast-iron. Practically all of these consist of a fabric strip or bandage wrapped around the pulley surface and cemented to the pulley and to itself. The degree of satisfactory operation is dependent almost entirely upon the care and thoroughness of its application. For this reason, many manufacturers of pulley coverings insist that the work be done by their men. The most common cause of faliure is fingering and pulling at the end or along the edge of the covering to see how tight it is sticking. Unless the loose end or corner is trimmed off at once the winding loosens rapidly.

A type of pulley covering recently introduced from Europe, where it has been in extensive use for a number of years, is provided with a frayed or raveled edge which is turned and cemented under the inner edge of the pulley rim to aid in preventing loosening at the edge. This covering also is available with a straight edge and is usable on lathe or other step-cone pulleys, even under conditions of reversal, it is stated. The covering consists of an asbestos cloth which is soaked in the special cement before application.

* * *

Cleaning Leather Belts

DIRTY leather belts are of three types: Oil soaked belts, as on screw machines; dry and dust coated belts; and those with a coating of dust and sticky belt dressing. If too oily, the extra tension at starting presses out the oil and the belt slips. Also, when dirty, especially when surface caked, the belt slips on the polished belt surface. Dry belts lose their elasticity and strength.

Cleaning serves two purposes: To remove the oil or dirt; and, of equal importance, to relubricate the belt to replace in the leather the natural oil or grease which has dried out or been absorbed in the coating of oil or dust. Some maintenance engineers advocate slightly different methods of treatment in each of the three cases.

Oil filled belts usually require soaking in gasolene, naptha or carbon tetrachloride to remove the oil. The latter is recommended for safety because it is not explosive nor inflammable. This solvent and the excess oil is then removed by scraping and rubbing or some plants use a clothes wringer and then scrape and rub. If the belt is oily only on the surface it may be cleaned by rubbing with a cloth soaked in the solvent and scraping off the oil and dirt. One objection to soaking the belt in a solvent is that the natural lubricants in the belt are all removed and few workmen work in sufficient new belt dressing to replace them.

Belts that are merely dusty and dry require only surface cleaning and scraping. Dry belts, however, often require new belt dressing more than cleaning. When the surface is caked with dust and sticky dressing, belts usually can be cleaned by rubbing and scraping the surface. In obstinant cases it is better to lay the rubbing cloth soaked in solvent on the caked surface for a while than to soak the entire belt.

Dressing the belt to replace the natural grease which lubricates the fibers as the belt flexes is as important as the cleaning process. Even though a belt is not dirty it requires periodic dressing as the belt dries out in service, the rate of drying depending on the humidity of the surroundings.

Neatsfoot oil is one of the best belt dressings. Mineral oils should never be used. Most leather belt manufacturers have special dressings, usually with neatsfoot oil as the principal constituent. These dressings for relubricating the fibers in belts should not be confused with the sticky dressings used to prevent slippage.

Dressings must be rubbed in by hand, working and flexing the leather until it is soft and pliable but not so oily or greasy that it is slippery. Be sure that the lubricant has penetrated to the center of the belt, especially on belts which have been soaked in a solvent to remove mineral oils. The life of the belt depends to a large extent on the amount of "elbow grease" used with the neatsfoot oil. Dry belts deteriorate rapidly.

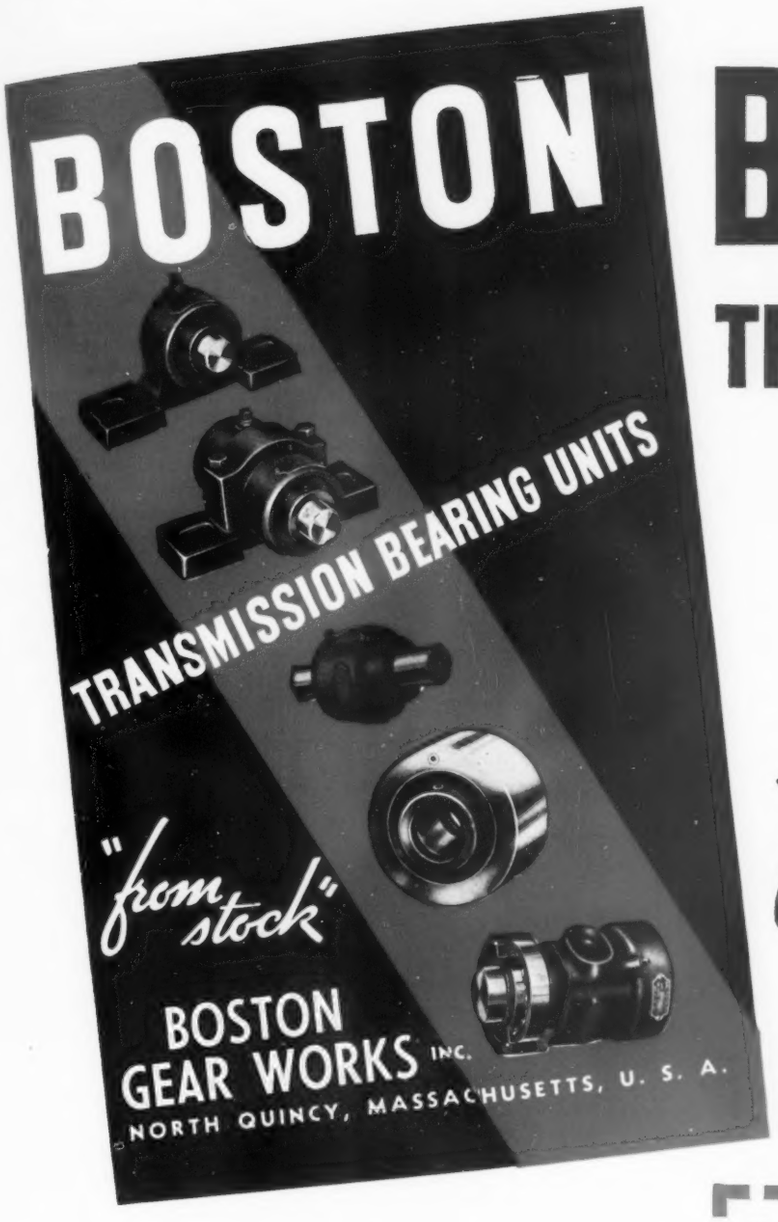
* * *

On chain driven lineshafts in plants with low ceilings it is often more convenient to hinge the chain casing so that the lower half can be dropped instead of raising the upper half. The case must be drained, however, before it can be opened.

* * *

As plain bearings wear, a slightly heavier lubricant may work better, as it will not run out so quickly. However, too stiff an oil may not flow into the bearing rapidly enough to maintain the proper oil film.

A new line of



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Welding, etc. . . .

by Robert E. Kinkead

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Creating New Markets

A PRONOUNCED trend may be discerned among the producers of metals and alloys in the direction of fabricating jobs involving new uses of the product. Producers of steel, aluminum, copper and other alloys all show the same tendency to do the job themselves rather than sell the fabricators on the idea of doing it. Use of the best available information on welding is of course a necessity in such cases.

The motive power behind this trend seems to be a belated recognition of the continual necessity of developing new markets for the products. The distinction is between following customer demand and creating customer demand. Such a change in policy constitutes a form of insurance against awaking suddenly to the realization that a market has disappeared and that the equipment for production of the metal has become obsolete.

The extent to which the producer of metals will engage in fabrication remains undisclosed at present. It is easily conceivable that overextension in the field might lead to ruin. A middle course is indicated as the best solution to the problem. Such a course would keep the producer alive to the changes in the markets for his products and would help rather than harm companies which fabricate only. Development of new markets for fabricated products is good for the fabricator, particularly in view of the fact that the fabricator is usually not in a position to develop such markets himself.

Welding Research

WELDING research being carried on by the American Welding society is valuable. The net result is bound to be more knowledge. No living person can be injured; all future generations will profit by the increase in knowledge of such labors. Pursuit of new knowledge is the highest manifestation of our civilization.

But research and development by corporations organized for profit ought to be something different from the work of the Welding society. Failure to recognize the difference results in degeneration of private research laboratories into organizations for operating slide rules and doing odd jobs. Private research and development must concentrate on specific jobs, the successful outcome of which will pay the cost of the effort and yield a profit. The personnel must be governed by penalties for failure and rewards for success.

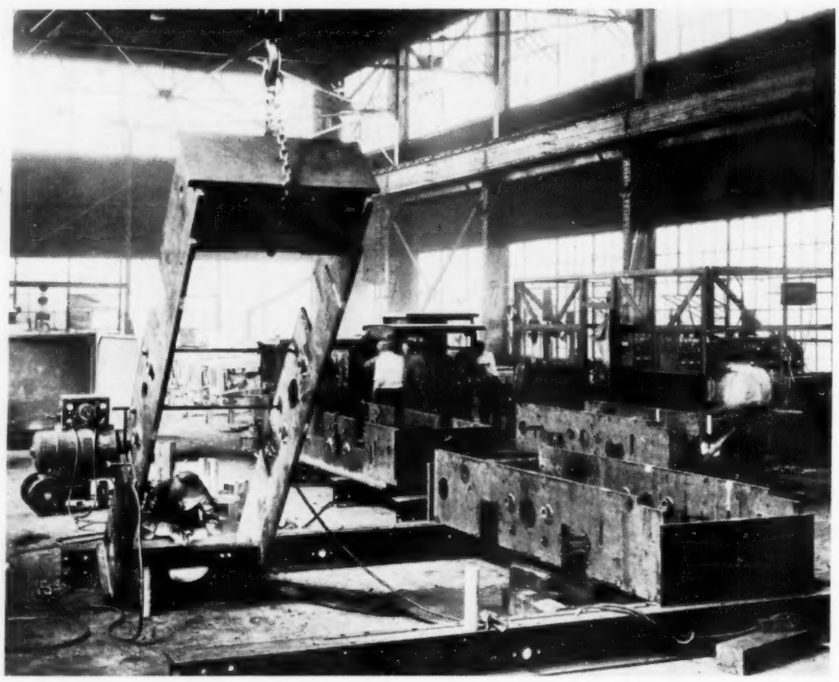
The idea of a job forever and "security" for workers in commercial research breeds stagnation. Many of the welding research laboratories of the country need reorganization along these lines.

Thinking

A STEEL mill we visit occasionally has porcelain enamel signs all over the place which carry the single word, THINK, in letters about 10 inches high. There is one on the welding shop. No one knows who had the signs put up; no one knows whether they accomplish any useful purpose.

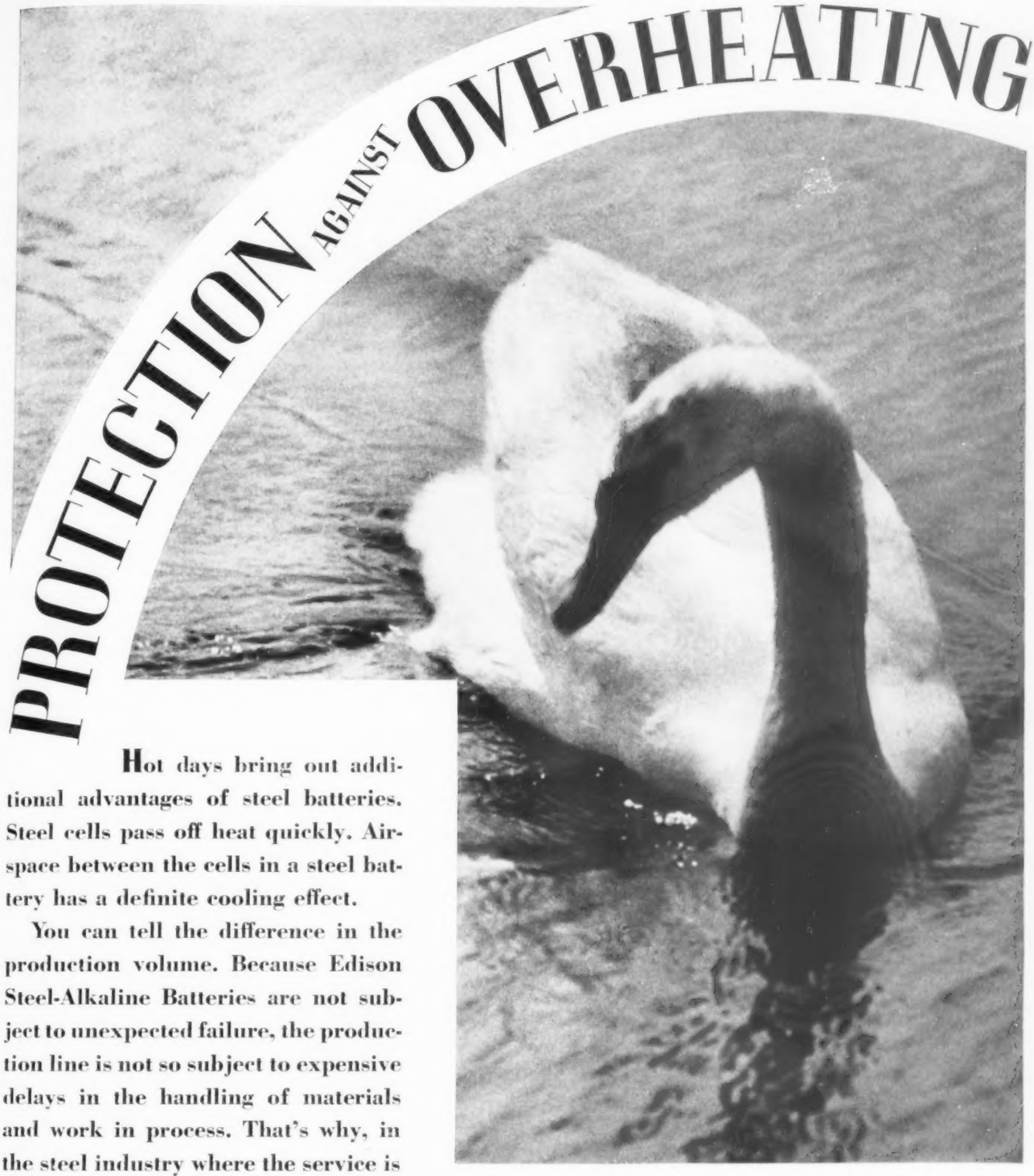
It occurs to us that the man responsible did not believe in signs, since if such had been the case, he never would have erected them. The process of thinking is as automatic and continuous as the process of seeing when a person is conscious and has his eyes open. There is an extremely limited number of people in the world who can think connectedly on one single subject for as long as 60 minutes; 3 minutes is a long period for controlled and directed thinking on any subject, with a few well-known exceptions. Of course, if the reader has a watch and a mind he can get the answer. It is unlikely he will brag about it.

Welding Locomotive Frames



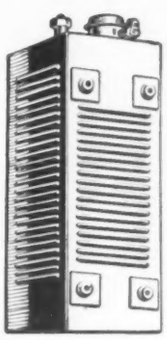
FRAMES of arc welded steel are being made in the plant of the Fate-Root-Heath Co., Plymouth, O., for installation in diesel-electric locomotives. The locomotives are being built by the company for use on the construction projects of the Tennessee Valley Authority. Photo courtesy Hobart Bros. Co., Troy, O.

PROTECTION AGAINST OVERHEATING



Hot days bring out additional advantages of steel batteries. Steel cells pass off heat quickly. Airspace between the cells in a steel battery has a definite cooling effect.

You can tell the difference in the production volume. Because Edison Steel-Alkaline Batteries are not subject to unexpected failure, the production line is not so subject to expensive delays in the handling of materials and work in process. That's why, in the steel industry where the service is hardest, 7 out of every 10 trucks for the handling of materials are equipped with Edison Steel-Alkaline Batteries. They do their work with less interruption; they require fewer repairs; they cost least per year. Get "Protected Power" with



EDISON Storage BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

Progress in Steelmaking

Mechanical Black Plate Separator Reduces Opening Costs One-Third

MANUAL separation of black plate after the annealing operation always has been a laborious as well as an expensive step in tin mill practice. The workman, known as the opener, can only separate a batch of plates ranging from 72 to 140 inches high per turn of 8 hours, depending upon the temperature at which they were annealed. High temperature annealing, while most desirable, causes a large percentage of "stickers" to arise. When this is the case the opener is obliged to pound the stack of annealed sheets with a 16-pound sledge hammer in order to strip the sheets apart, thus curtailing production.

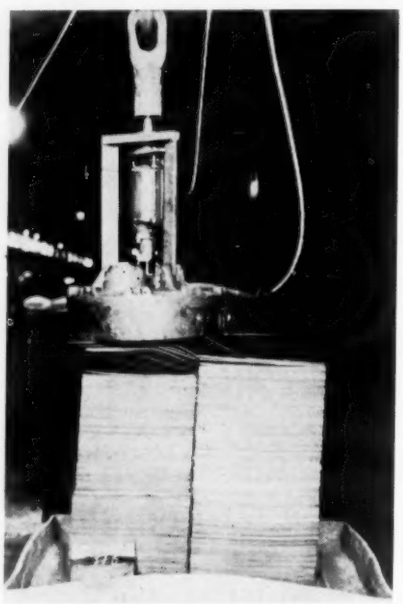
To obviate the physical effort involved in the opening process, therefore, there has been developed a curved face magnet which lifts and drops rapidly to produce a sledging action. When a number of black annealed plates are drawn into the concave magnet surface by the magnetism they are forced to flex on one another similar to the movement of card on card when a deck of cards is flexed.

Hammer Is Provided

The magnet, 29½ inches diameter, has the working face curved and V-shaped, the center being about 1 inch out of level with the periphery. As shown in the accompanying illustration, the unit is carried by a tripod which also supports a syntron, 25-cycle, alternating-current hammer. The latter is equipped with a tool having a head resembling a large door knob. The magnet and hammer cables both run to the cab of the crane.

In operation, the magnet unit is lowered until the hammer head rests on the pile of black plates. The craneman starts the hammer and allows the sledging action to continue for about 30 seconds. He then lifts the magnet about 1½ inches and throws the current on and off. The automatic quick drop and arc suppressor features built into the magnet are important because they afford a quick lift and drop and do not subject the controller contacts to punishment. The magnet then is elevated about 2½ inches above the pile and the current put on and off rapidly which results in the separation of many sheets as shown in the illustration. The magnetic unit now is transferred to another pile of annealed black plates and the operation repeated. Meanwhile, the previously separated plates are inspected and transferred to the cold rolling department.

It is estimated by one tin plate producer that with two of these units 18 men would be able to separate a stack of black plate 2800 inches high per turn of 8 hours, compared with the present crew of 28 openers. Moreover, this could be accomplished with less effort, a better rate of pay with a saving on the operation of at least one-third. The apparatus for the magnetic separation of black plates is built by the Ohio Electric Mfg. Co., Cleveland.



Magnetic separator raised 2½ inches for repeated magnetism on-and-off operation

◆ ◆ ◆

Handles Broad Strip Steel

Coils of strip steel up to a maximum width of 76 inches will be handled at a new mill by two duplicate electric trucks now under construction. Each truck will have a capacity of 40,000 pounds.

◆ ◆ ◆

Reduces Oil Requirements

About ten years ago a 24-inch 2-high sheet mill pinion, with necks 32 inches long and 16 inches diameter, was placed in initial operation at a plant in this country. The bearings and gears were designed to be lubricated with the same material. Cylinder stock was used for the first week, which had to be carried at a high level to get it to the upper bearings. This resulted in an excessively hot unit and a large consumption of oil. The second week an oil reduced asphaltic base gear shield type of lubricant was used with no better results than with the cylinder stock. The third week a metal grab resisting film lubricant was installed. The pinions were operated for about four years without the removal of either a bolt or the cover. This grade of lubricant has been used continuously and with a minimum of makeup added.

◆ ◆ ◆

Lowers Fuel Consumption

Heat conservation in open-hearth practice is afforded by having 15 inches of fire clay brick in the checker chamber roof covered with a 4½-inch layer of insulation and all cracks filled with a slurry, according to practice at an Ohio shop.

Flying Shears Have Many Applications In Modern Mills

BY H. H. TALBOT

Chief Engineer, United Engineering & Foundry Co., Pittsburgh

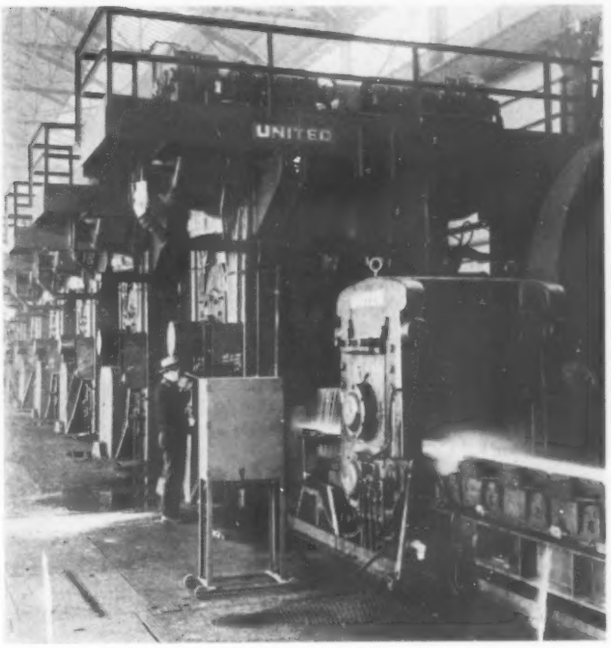


Fig. 1—Drum-type flying shear used at delivery end of 37-inch hot strip mill to crop front and back ends of coils or to cut sheet lengths. Capacity 36 inches wide x ⅜-inch thick, 1000 to 2000 feet per minute, 10 to 32-foot lengths in ⅛-inch steps

STEADY advance in strip rolling speeds during recent years has necessitated an intensive development of shearing technique. Not only is it necessary to cut sheet from strip as it leaves the mills at speeds as high as 2000 feet per minute, but it also is required that consecutive sheets be held to extremely close length limits.

Both reciprocating and drum-type flying shears have established themselves in the rolling industry. Reciprocating shears are more accurate, but have not as yet been adapted to the high strip speeds now being used in modern mills.

The latest drum-type shears are old in basic principle, but have been improved during recent years until they now can be used in cutting sheets from strip coming from the rolls at speeds ranging from 150 to 2000 feet per minute. Likewise, their accuracy has been improved steadily and it is now possible to cut consecutive sheets accurate in length to within 1/32-inch in some cases and to within ¼-inch at practically any speed.

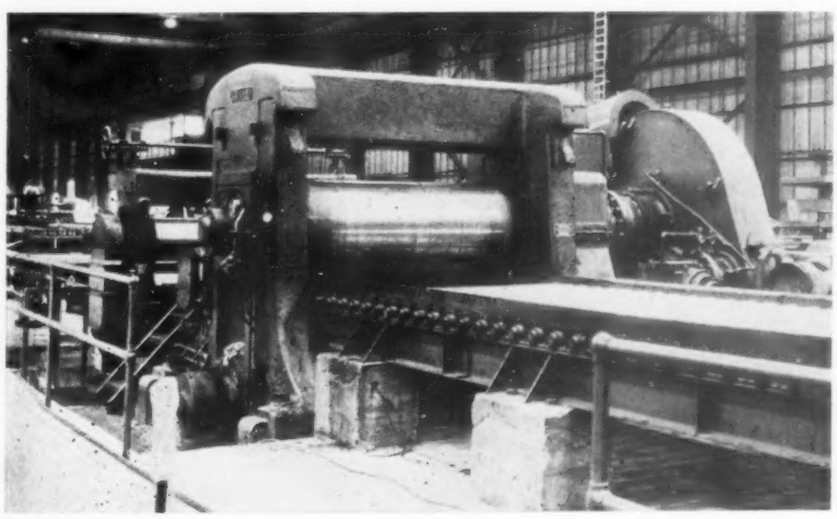


Fig. 2—Drum-type flying shear located at end of cold run table of 80-inch hot strip mill to crop front ends and to cut from 8 to 20 feet long in ⅛-inch steps and up to 0.140-inch thick

Drum-type flying shears have five major locations or applications in modern mills. These are at the last stand of the hot mill, at the end of the cold run table in a hot mill, in the cold rolled strip cut-up line, in connection with the production of skin passed cold rolled stock and in the production of tin plate. Differences in products and types of applications require modifications in the design of the shears, but the basic principles and advantages are common to all drum-type flying shears.

Must Fill Many Requirements

These units must be compact and sturdy, yet simple and easily accessible with the controls so located that the operator has good visibility and can make changes in cut lengths quickly and easily. Provision must be made to take up backlash due to gear wear so as to assure accuracy of the knife action. Nicking of the strip must be avoided and knife engagement must be adjustable readily.

All flying shears require a "feed" or measuring roll device for feeding the strip to the shear. This device may be a roller leveler, or a pair of pinch rolls; or when the shear follows the last stand of the rolling mill, the work rolls of the mill become the "feed." The length of strip

Fig. 3—Providing a sag in the strip during feed interval compensates for pull during cutting interval

cut, therefore, depends upon the number of cuts per minute divided into the number of feet of strip fed per minute.

Cutting speeds and ratios in the United drum-type shears are all controlled through a set of specially-designed gears, accurately cut and maintained in accurate and positive alignment by Timken bearings, which handle the thrust developed by the helical gears as well as the radial loading and serve to locate all gear shafts. This gear box is extremely intricate, more than 2000 combinations being provided in some cases, and is the result of years of development. Through it the shear drums are set in motion at the proper speed relative to the speed of the feed rolls to give the desired length of cut by the knives.

For example, assume that cold strip is being fed by the measuring rolls to the shear at a rate of 600 foot lengths. To do this the shear must make 100 cuts per minute.

How Adjustments Are Made

If the strip is cut into 12 foot lengths, 50 cuts per minute must be made. This will require a gear box ratio of twice that for the 6 foot lengths. Intermediate lengths correspond to the number of cuts per minute, or the revolutions per minute of the shear drums relative to the revolutions per minute of the feed rolls. Where variations in cut lengths of from 6 to 12 inches were formerly acceptable, the gear box on these new flying shears now enables increments of ¼-inch to be made, such as 6 feet-0¼-inch, 6 feet-0½-inch, 6 feet-0¾-inch etc. and down to 1/32-inch increments if desired.

To further explain the action of the shear, assume that the upper drum has a knife circle of 6 feet and that the bottom drum knife circle has a circumference of 12 feet. This gives a 2:1 ratio for the drums and the meshing drum gears will have pitch diameters the same as the respective diameters of the knife circles. Under such a setup it will be seen that the top drum makes two revolutions while the bottom drum goes around once, the knives meeting at the second revolution of the top drum. The shear therefore will cut on each revolution of the top drum, so its speed, revolutions per minute, will equal the number of cuts per minute.

Therefore, if the bottom drum is revolving at 50 revolutions per minute and has a knife circle circumference of 12 feet, the knife speed

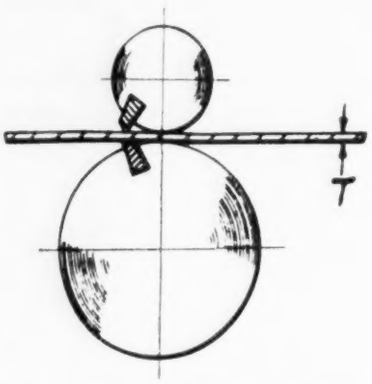


Fig. 4—Movement of shear drums during a cut

is 600 feet per minute, which is equal to the speed at which the strip is being fed to the shear. To cut 6 foot lengths, the bottom drum speed must be 100 revolutions per minute, giving a "V" speed of 1200 feet per minute, or twice the strip speed. This variation, from the same to twice the strip speed, is about the maximum allowable variation, but it should be remembered that hot strip speeds have increased during recent years until a speed of 2000 feet per minute now is being used on several mills where United drum-type shears are in service.

If a second blade was inserted in the bottom drum of the shear, diametrically opposed to the first knife, a cut would be made with each revolution of the top drum and a half revolution of the bottom drum. Using the same speeds as before, sheets could be cut in 3 foot and 6 foot lengths. Drum ratios may of course be changed, as for example 3:2, 4:3, 5:4, etc. giving cuts each third, fourth and fifth revolution of the top drum. Using multiple ratios materially increases the minimum lengths that may be cut on a drum-type flying shear without recourse to objectionably large drums and at the same time keeps the design down to reasonable proportions.

Introduced Serious Problem

The use of multiple ratio drums introduced another serious problem which had to be overcome before they could be used successfully. As the knife circles are fixed, the tip of each blade always comes to the center of the strip as it passes normally through the shears. Consequently, unless special provision to avoid contact is made, the knives would nick the strip at each non-cutting revolution, producing marred or scrap strip. However, a "nonmarking" device now functions to flip the strip out of the path of the knives and completely eliminate this difficulty.

Provision must be made in shears of this type for the completion of the cut, as the strip never stops. Fig. 4 illustrates how the shear drums move during the cut. For example, assume that the cut is completed during ½-inch travel of the strip. When the knife speed is equal to the strip

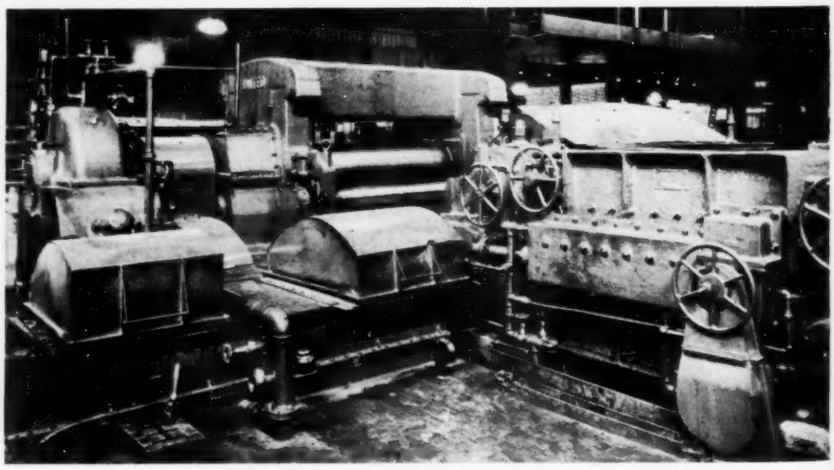


Fig. 5—Drum-type cold strip shear which will cut up to 10 gage and up to 76 inches wide in steps of ⅛-inch and in lengths from 60 to 172 inches. Roller leveler and feed rolls shown in foreground

speed, no "yank" or pull occurs. However, if the strip is being cut into 6 foot lengths, the knives travel twice as fast as does the strip and consequently will travel 1-inch while making the cut. This causes a definite pull of ½-inch and if the strip is restrained, a "draw" or tearing cut will occur.

In the case of cold strip, where a leveler or pinch roll feed is used, Fig. 3, there would occur an objectionable instantaneous slippage of the sheet in the rolls unless special provision is made to avoid such a possibility. This difficulty is overcome by locating the "feed" far enough away from the shear to allow for a looping skid before the strip enters the shear. The strip is allowed to sag during the "feed" interval enough to compensate for the pull during the cutting interval. An air operated pinch roll can be engaged to push the last end of the strip through the shear after it has passed out of the leveler.

Production requirements ordinarily control the type of shear to be used. Sometimes two units are advisable at the end of a hot strip mill where shifts from coil to sheet production are frequent. The first shear usually is designed to crop the leading end of the strip and then cut the strip into consecutive uniform lengths, being synchronized with the work rolls of the last mill stand. The second shear would be used only for cropping the front and rear end of the strip going to the coilers. This unit requires only a simple start and stop motor unit. Each mill has its own problems and flying shears must be designed individually to meet these conditions.

Effect of Alloys On Welding Rods

(*Concluded from Page* 49)

intergranular corrosion in weld metal even on crossed welds. The phenomenon in question is related to a carbide precipitation at temperatures in the vicinity of 500 degrees Cent. Titanium, tantalum and columbium tend to inhibit this carbide precipitation by preventing solution of the carbide. This is effected to the greatest degree by columbium and the oxidizing tendency of the columbium during the welding operation is such that the material may be readily protected by reasonably small amounts of silicon.

This is true to a much lesser degree in the case of tantalum and titanium, so that it is most difficult to obtain sufficient amounts of these materials in the deposited weld metal in an un-oxidized state. The net result is the 18 per cent chromium and 8 per cent nickel low-carbon type of welding rod with columbium in sufficient amount to combine with the carbon and keep it out of solid solution, and sufficient silicon to protect this columbium during the welding operation, approximately 1 per cent columbium and 0.75 per cent silicon being used.

It should further be noted in connection with all of the high alloy welding materials that while an attempt is made to get sufficient fluxing action with manganese and silicon, in general this is difficult because of the large quantities of chromium and other refractory oxide-producing elements present so that a flux is commonly used. The major function of the flux is to dissolve the oxide on the base metal, but it further aids in obtaining the desired viscosity of the slag covering on the weld proper.

Silicon Not Harmful to Welds

Much has been said to the effect that small quantities of silicon are undesirable in welding electrodes, in that they give rise to porosity in the deposited metal.

It is well known that silicon may increase the amount of gas held in solid steel, whether this be in the form of oxides which may later react, dissolved gas as such, or gas occluded on the surface of silicates. With properly made steel to which silicon has been added as a ladle addition, the amount of gaseous element held in the steel is greatly reduced, and the writer knows of no instance in which such steel has given rise to porosity in welds made with reasonably good, normal technique.

The emphasis on manganese rather than silicon as the main deoxidizer in heavily-coated electrodes is worthy of comment. Generally the manganese is introduced into the operation as ferroalloy contained in the coating, but this coating almost invariably consists largely of silica in one form or another, so that even in this application the principle of the mutual fluxing action of the manganese and silicon oxides is utilized.

Of the strengthening elements, nickel, molybdenum and chromium are general, the nickel resulting in a strengthening of the ferrite matrix and the molybdenum or chromium resulting in an iron with a strong tendency to become pearlitic. As yet, other alloying elements have not been commercially used in cast iron welding to any great degree, but newer and improved types of cast iron rods may be expected with the increased understanding of the metallurgy of this ancient product.

Air Conditioning Condensing Unit of Sealed-in Design

(*Concluded from Page* 39)

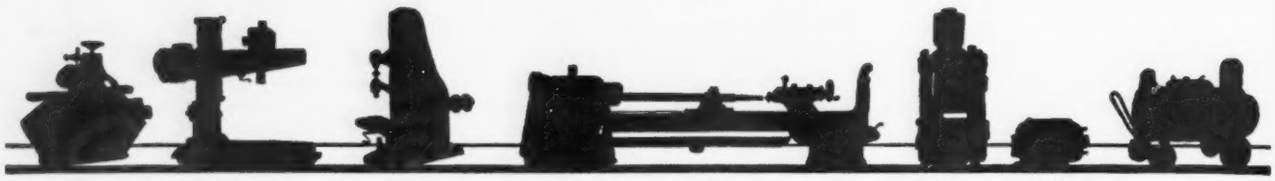
and heads is done on a radial drill press, the casting being swung on a trunnion fixture.

After machining, the casting and parts are thoroughly cleaned, including automatic solvent dipping and spraying to remove all dirt, oil and other foreign matter. They are assembled in an air conditioned room which is kept under a slight pressure by introducing filtered outside air. The slight pressure causes the air to leak from the room rather than into it. This precaution is taken to keep the compressor as free from dirt as possible, to insure long life and trouble-free operation. Each compressor is run in to smooth up bearing and cylinder walls while in the assembly room, by driving it in a bath of oil. The oil is continually circulated and filtered. The compressor is gradually brought up to speed, the total running-in process taking about nine hours. The compressor, complete with condenser, is tested numerous times for leaks and each unit is completely tested with its control for performance. Rating of the larger units is obtained by loading the unit by means of a steam calorimeter. Dry superheated steam is admitted to the calorimeter and the condensate measured. From the data noted the rating is easily obtained. The smaller units are loaded by means of an electric calorimeter, the electrical energy being converted into heat instead of using steam. Before leaving the test floor the units are filled with sufficient refrigerant to give a gas pressure slightly greater than atmospheric, using the refrigerant for which the unit is designed. The units then are painted, boxed and made ready for shipment.

Future Seems Promising

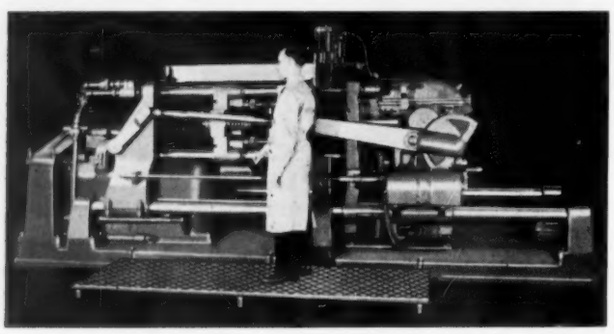
In increasing its activity in the air conditioning field, the Westinghouse company is actuated by an optimistic attitude as to the future in this field. It points out that orders for air conditioning systems and equipment, according to government statistics, aggregated $11,667,129 during the first four months of 1936. In the first three months of 1936, sales of condensing and evaporator units by 27 manufacturers showed an increase of 23.4 per cent over the same period of 1935; during this same period the Westinghouse company showed a gain of 91 per cent. Contrary to general impression, the company finds that the air conditioning is a year-round rather than a seasonal business. It reports there is a pronounced trend for small stores and shops to install air conditioning.

New Equipment



Die-Casting Machine—

Madison-Kipp Corp., Madison, Wis., is introducing a new large automatic die-casting machine, which



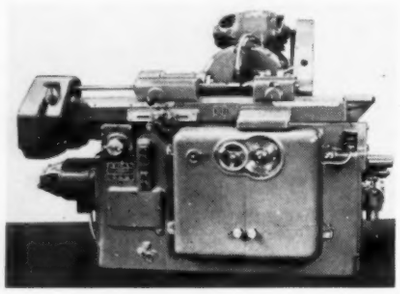
Madison-Kipp automatic die-casting machine

will handle alloys of zinc, lead, aluminum or tin. The effective capacity for the standard direct air pressure gooseneck is 25 pounds in zinc alloy. Larger than standard goosenecks may be applied, and plunger-type goosenecks may also be applied as extras. The capacity of the metal pot is 1200 pounds in zinc alloy. The standard operating speeds are 5, 3.33, 2.5, and 1.66 shots per minute, with other speeds available by changing the motor drive gears. The machine is driven by a 7½-horsepower multispeed motor through a silent chain drive at 4.86 to 1, then through worm and wheel with a ratio of 74 to 1. The crosshead is equipped with four air cylinders to which wedges are attached so that when the machine is in the closed positions these wedges will automatically drop over the four movable die carriage tie rods and provide a lock for the carriage. Length of the machine is 204 inches, width 72 inches, and height 82 inches. Castings can be made up to 22½ x 28½ inches in size.

♦ ♦ ♦

Thread Grinder—

Jones & Lamson Machine Co., Springfield, Vt., is announcing a new automatic thread grinding machine in which the primary element is a truing device which keeps the wheel sharp continuously throughout its effective life, without disturbing the size adjustment to which the wheel is set. The machine is designed to grind threads up to 8-inch diameter and 9-inch length. The thread length may be ground on any part of a length of 24 inches. It is made to swing work of 11½ inches maximum diameter with a maximum work length of 31 inches between centers, and will handle threads up to 1 1/16



Jones & Lamson automatic thread grinding machine

inches on long work held in a chuck. Grinding may be done from solid or previously roughed stock. Standard equipment includes grinding wheels of 20-inch diameter. A rheostat is provided which maintains a constant peripheral speed as the diameter of the wheel decreases with wear.

♦ ♦ ♦

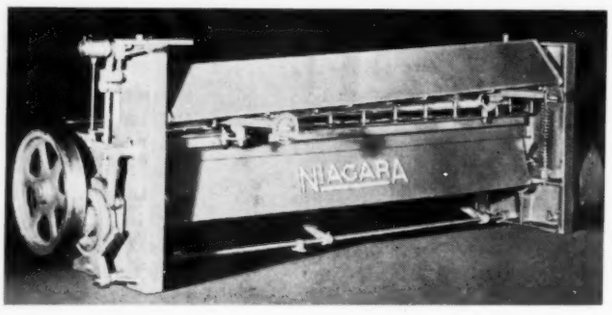
Power Squaring Shears—

Niagara Machine & Tool Works, 637-697 Northland avenue, Buffalo, is introducing a new line of power squaring shears with capacities of 10 to 12 gage, built in 8, 10 and 12-foot cutting lengths. They are of underdrive design. The crosshead is operated by connecting rods running direct to the crosshead from the eccentrics, thus relieving the housing from tension stresses. Heavy webbed beds are keyed and bolted to housings to assure and maintain positive alignment. Rear web of the bed covers the cross shaft, protecting the operator when removing sheared pieces at rear. Sheets can be accurately cut to a line because the cutting line is accurately visible from the front of the shear between the pressure feet as well as a position vertically above the cutting edge as observed through an adequate opening between the hold-down and the rear-sloping front web of the crosshead.

♦ ♦ ♦

Photocell Control—

Weston Electrical Instrument Corp., Newark, N. J., has introduced a new photoelectric control unit in which sensitivity and operating speed have been increased and which is said to be dependable under adverse service conditions. It is applicable in cases where interruption of a light beam may provide the initial impulse for opening or closing an electrical circuit, such as counting, sorting, weighing, processing control, safety cut-offs, and similar operations. As-



Niagara power squaring shears

sembly consists of a photocell of high output characteristics in a protective mounting, a relay unit in a separate panel box, and a light source of standard design. A light intensity of 100 foot candles provides adequate energy. Output capacity is 500 watts, and speed of response is 0.15 seconds. Operating speeds up to 400 responses per minute are possible.

• • •

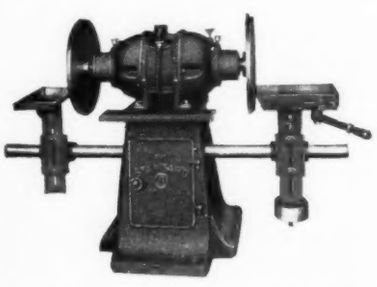
Welding Electrodes—

Harnischfeger Corp., Milwaukee, announces a new line of coated welding rods for direct-current welding. The assortment includes five different types with both high and low rates of fluidity for various types of work in welding in flat, vertical or overhead positions and with ferrous and nonferrous metals. Service tests show tensile strength of weld from 55,000 to 75,000 pounds per square inch with various types of rods ranging from 3/32 to 3/8-inch in size. According to the company, the new electrodes are designed primarily to speed up welding operations with a smoother, more easily handled arc and to reduce spatter losses.

• • •

Disk Grinder—

Standard Electrical Tool Co., 1938-1946 West Eighth street, Cincinnati, is the builder of the disk grinder illustrated herewith. Grinders are built in sizes of 1, 2, 3, 5, 7½, and 10 horsepower to carry disks from 10 to 30 inches in diameter. The disks are accurately machined and balanced and mounted on a nickel steel shaft, fitted with heavy-duty ball bearings. A special radial thrust bearing is provided to take care of the end thrust. A magnetic starter having overload and undervoltage protection is located inside the base and connected to a push-button station at the front of the machine. Units may also be arranged as combination grinders and disk



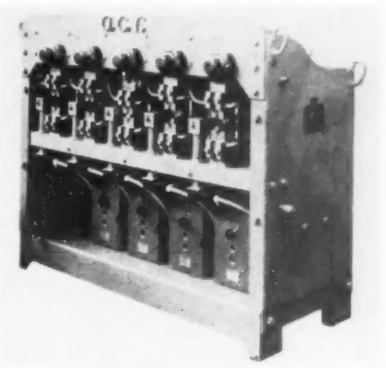
Standard 7½ horsepower disk grinder

grinders, one end being fitted for disk grinding and the other for peripheral grinding.

• • •

Electric Slug Heater—

American Car and Foundry Co., 30 Church street, New York, announces a new Berwick electric metal slug heater on which the jaws have a vertical movement. Shown in the accompanying illustration, the heater is equipped with "electric eye" and an automatic kicking-out device, leaving the only operation required of the operator the insertion of the piece, which will be heated and removed from the heater at the exact temperature for which the photocell tube is set. All adjustments are readily made and it is unlikely that an operator could overheat or underheat the pieces. The company also has available horizontal heaters similarly built and controlled for heating any stock from ¼ to 3 inches in diameter, adjustable for any length heat from 1 to 24 inches at any point on the bar.



Berwick electric metal slug heater with vertical moving jaws

• • •

Portable Press—

Hanna Engineering Works, 1765 Elston avenue, Chicago, has recently designed a portable press for pressing shackle pin and bushing assemblies into automobile frames at one stroke. The power unit consists of a piston and cylinder assembly direct acting on the live die. The valve operates easily, permitting control by either thumb or fingers. After completing the power stroke the operator releases the valve trigger which automatically reverses the mechanism. Cushioning is provided for the last portion of the piston travel. The design of the dies is such as to assure correct alignment of the pin and bushing assembly into the

Hanna portable press for use in automobile assembly lines

spring hanger and avoids the necessity of the operator first starting the pin and bushing assembly by hand. The total weight of the press is 125 pounds, and it is suspended over the chassis frame conveyor line on a balancer.

• • •

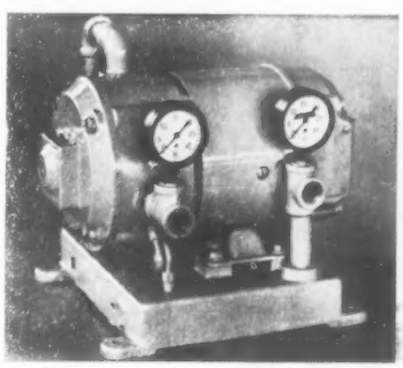
Core Maker—

Harry W. Dietert Co., 676 West Grand boulevard, Detroit, has placed on the market a new core maker. It consists of three major parts, a cast iron base on which is mounted a cast iron table and a vertical plate which is vibrated with either an electric or an air vibrator. A patented connection prevents the vibration from reaching the table on which the cores are stripped. An easily movable vertical guide is mounted on the vertical plate. The core box may be rammed by hand or by core blower and then turned over on the core plate resting on the table of the core maker. Any square cornered metal or wooden core box of single or gang type may be used.

• • •

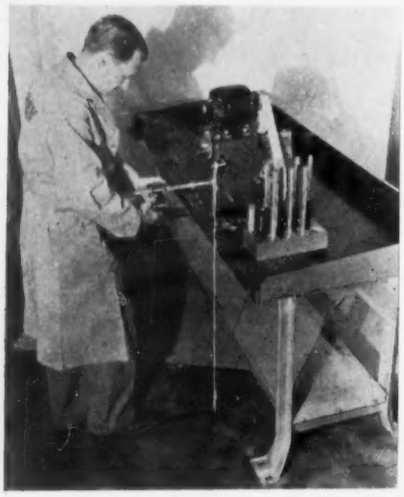
Motor Pump—

Steel City Electric Co., Pittsburgh, is presenting the Motoair combined motor and pump unit. These machines are available in a wide range



Motoair combined motor and pump unit for vacuum or air pressure operation

of capacities in either single or double units, for operations as moderate air pressure or vacuum pumps. Air volumes available are from 9 to 70 cubic feet per minute. The pump is direct drive, eliminating friction and heat due to belt slippage. The



Sunnen precision hone for small parts

units are equipped with an automatic pressure lubricating system, constructed so that the oil cannot get into the air lines. Any type motor required will be supplied.

♦ ♦ ♦

Precision Hone—

Sunnen Products Co., 7900 Manchester avenue, St. Louis, is announcing a new precision hone for small diameter bushings and similar small parts. The size range of the hone is from 0.480-inch to 2.400 inches with an accuracy within 0.0001-inch. Any small hole free from keyway and not over 7 inches in length may be handled. Cutting pressure is controlled by foot pedal and any metal other than lead or babbitt may be honed. A micrometer stop prevents grinding oversize and permits easy duplication of size. Cutting speed is 0.004 to 0.006-inch in aluminum or cast iron in a hole 2 inches long and 1 inch in diameter. The hone is supplied with a ¼-horsepower motor, for 110-volt, 60-cycle alternating current operation.

♦ ♦ ♦

Curving Rolls—

George Whiting Co., 1719 Elston avenue, Chicago, announces an improved type of culvert curving rolls. The machines are fitted with double friction clutch pulleys for running the rolls in both directions, and rolls may be of plain or corrugated type. The top roll is set directly over the bottom roll, and the back roll is adjustable diagonally. The end housing is hinged and coupled directly to the top roll, and can be lowered by sliding a catch to one side for easy removal of the curved pieces. The machine need not be stopped to remove the completed pieces, resulting in a saving of time. Capacity of the machines is formation of No. 10 corrugated sheets 2 2/3-inch corrugations ½-inch deep to an 8-inch diameter 26 inches wide.

♦ ♦ ♦

Controller—

Bristol Co., Waterbury, Conn., announces a new pneumatic-type controller for temperature, pressure and liquid level, designed for use where a chart record of the fluctuations is not required or where recording instruments are already in use. The instrument is a compact device of simple construction in which the most important feature is the precision measuring element. It is of the same type as the elements in the

Bristol indicating pneumatic controller

recording instruments where accuracy is at a premium. The controller is equipped with a wide range sensitivity adjustment, and can be changed from direct to reverse acting by the user. The case is dust, moisture, and fume proof, and is offered for either wall or flush panel mounting.

♦ ♦ ♦

Flexible Shaft Tool—

Swartz & White Mfg. Co., Binghamton, N. Y., has recently introduced a flexible shaft outfit for shop use, mounted on a caster-equipped stand for easy portability. The motor is of ½-horsepower capacity, for operation on either 110 or 220-volt 60-cycle alternating current and is ball bearing. The unit is supplied with starting switch and cord. The flexible shaft is 7/16-inch in diameter and 6 feet long, encased in rubber. It has a ball bearing handpiece. Weight of the entire unit is 95 pounds.

♦ ♦ ♦

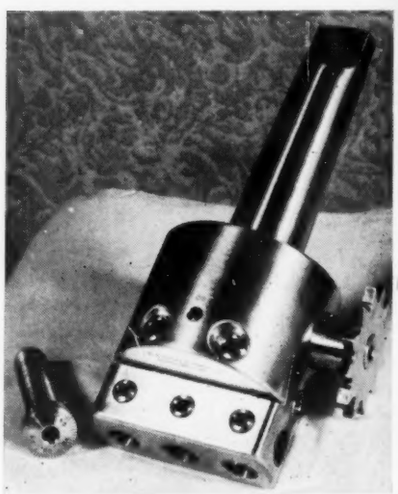
Pneumatic Wrench—

Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, announces a pneumatic tool which is a combination hammer and wrench, designed for the removal of all types and sizes of nuts and staybolts. The tool, known as the Thor Hamerench, delivers 1800 blows per minute and operates in an 8-inch working space. Overall length is 22½ inches and weight is 25 pounds. The socket is actuated by a ratchet collar, which receives its motion from a piston in the hardened steel barrel. All torsion developed by the impact is absorbed by the tool, preventing fatigue to the operator. Changing the socket from one end of the spindle to the other makes the tool reversible. The shank is 1 inch square, and equipment includes chuck 1⅝-inches hex across flat to accommodate sockets.

♦ ♦ ♦

Combination Head—

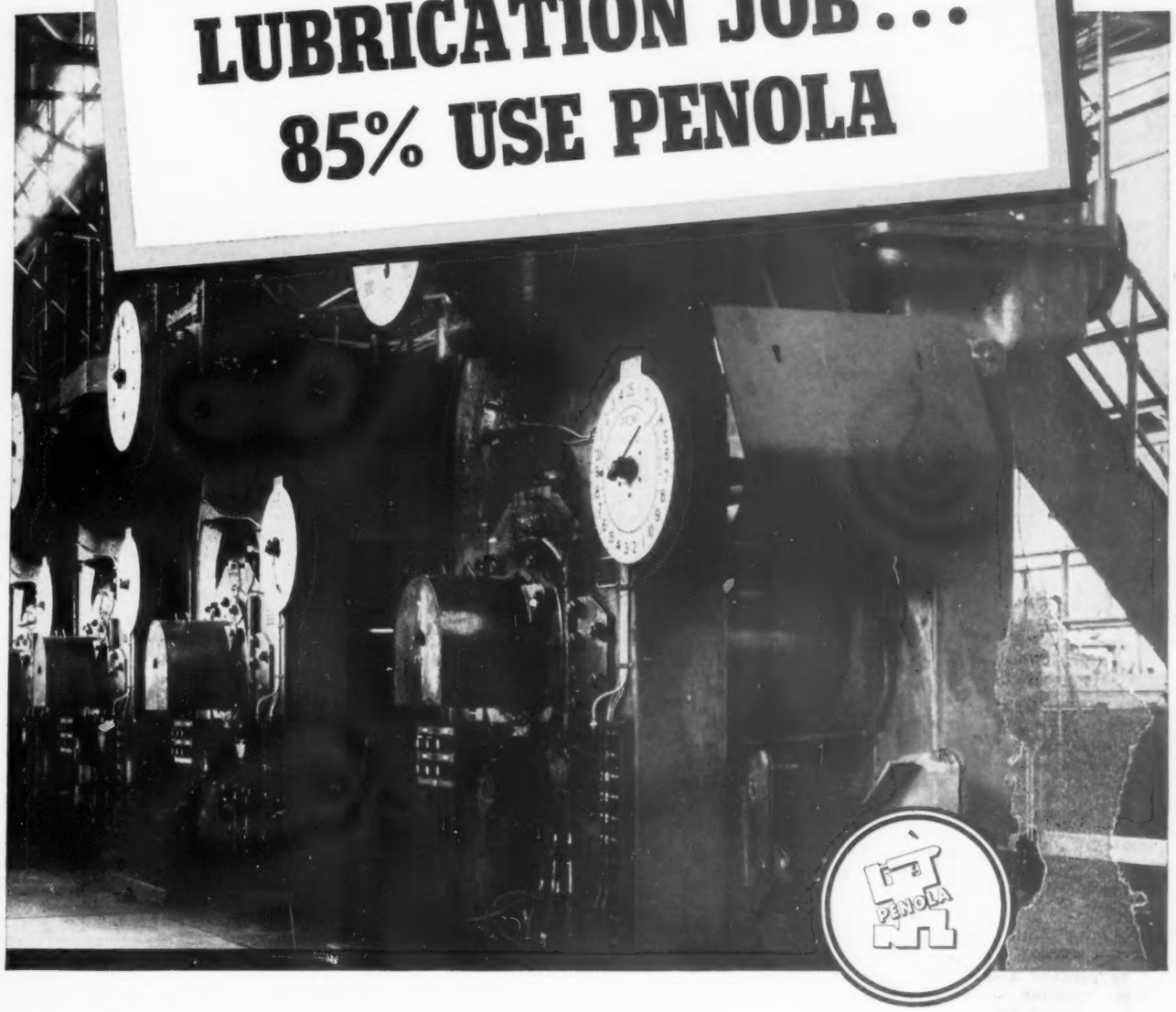
C. C. Craley Mfg. Co., Box 192, Shillington, Pa., has recently brought out a new combination boring, turning and facing head for work up to 20 inches in diameter. The head is of all-steel construction and is intended for heavy-duty work. The star wheel shown in the illustration is used for automatic adjustment while the head is in motion. A tripping device is provided which will move the star wheel one or two points at each revolution of the head. The graduated dial screw replaces the star wheel in boring operations where constant size is re-



Craley combination boring, turning and facing head

quired. Hardened tool steel is utilized in the construction of the tool block and the dovetail bearing.

FOR STEEL'S TOUGHEST LUBRICATION JOB . . . 85% USE PENOLA



WHEN engineers built four-high continuous mills with roll neck roller bearings, they created the need for a new lubricant. In the giant new equipment, pressures up to 5,000,000 pounds per bearing are developed. Previously existing lubricants—"soap filled greases"—broke down under this service and bearing failures were a major item of operating expense.

Penola developed a lubricant which withstands over three times more pressure than previous lubricants were capable of. Under such conditions it's easy to understand why Penola lubricates over 85% of this equipment. In fact, Penola makes and sells more steel mill lubricants than any other company in the world.

Consult Penola whenever lubricating difficulties must be met, money saved, and protection assured.

PENOLA LUBRICANTS

PENOLA INC.
Formerly
PENNSYLVANIA LUBRICATING CO.
Pittsburgh, Pa.
Grease Works Operated at
Baltimore, Md. . Baton Rouge, La.
Eldorado, Kas. . Pittsburgh, Pa.

LUBRICATION FOR THE STEEL INDUSTRY · 1885 to 1936

New Trade Publications

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland.

Hand Tools—Keystone Mfg. Co., Buffalo. Catalog No. 30, describing hand tool products, including sizes and prices.

Lathe Grinders—Dumore Co., Racine, Wis. Catalog illustrating its lathe grinders and including comparative specifications.

Voltage Equipment — Delta-Star Electric Co., 2400 block, Fulton street, Chicago. New price lists, Nos. 3, 8-A, 9, 10, 31-B-1, 32-B-2.

Hydraulic Lathe—Monarch Machine Tool Co., Sidney, O. A bulletin, S-10-5/36-G/p-4, illustrating hydraulic multi-speed lathe with new features described in detail.

Grinding Chasers—Geometric Tool Co., New Haven, Conn. Bulletin, No. E-1, illustrating equipment to grind chasers for die heads and taps, also operating methods.

Molded Shapes—Norton Co., Worcester, Mass. A pamphlet, form 1282-1P-3-36-3M, describing norbide molded shapes, cylindrical gages and die shapes; prices and sizes.

Lathe and Drill Chucks—Westcott Chuck Co., 312 East Walnut street, Oneida, N. Y. Catalog No. 536, containing bulletins, each describing one of its products, including prices.

Precision Hone—Sunnen Products Co., 7900 Manchester avenue, St. Louis. A folder, No. PHG-57-4-36, describing operating and performance features of Sunnen precision hone.

Blowers and Pumps — Sutorbilt Corp., 2008 East Slauson avenue, Los Angeles. A catalog illustrating blowers, gas and vacuum, ball bearing, positive pressure, pumping equipment.

Cold Rolled Steel — Thomas Steel Co., Warren, O. Handbook compiled to provide a quick reference to vital information of frequent demand, for the special convenience of cold rolled strip steel users.

Exhaust Fans—Northern Blower Co., 6409 Barberton avenue, Cleveland. Bulletin No. 1002-2, illustrating and describing Norbic slow speed exhaust fans, used in connection with dust collection and fume recovery equipment.

Metal Lath and Plaster—Metal Lath Mfg. association, 208 South La Salle street, Chicago. Booklet describing uses of metal lath and plaster, both for new construction and modernizing.

Industrial Proportioning — Blaw-Knox Co., Pittsburgh. Bulletin No. 1529, illustrates and describes automatic, semi-automatic, and manually controlled batching equipment for industrial proportioning.

Graphic Surveys—Esterline-Angus Co., Indianapolis, Ind. Bulletin No. 436, illustrates methods of making power and labor more productive, decreasing waste, making entire plant cost-conscious, through plant surveys with graphic instruments.

Floodlights—Pyle-National Co., 1334 North Kostner avenue, Chicago. Bulletin No. 199, describing utility floodlights of two sizes; 150 or 200 watt lamps and a large size for 300 or 500 watt lamps; for indoor and outdoor use.

Tools—Bonney Forge & Tool Works, Allentown, Pa. Catalog No. 136, illustrating and describing their complete line of socket wrenches and tools; sets ranging in size from 3 to 138 assorted pieces, in a wide variety of prices, are also shown.

Metal Stamping—Niagara Machine & Tool Works, Buffalo. A folder, form 405, illustrating its small, new, inclinable presses equipped with patented 14-point engagement sleeve clutch, having single stroke, non-repeat and positive locking mechanism.

Foundry Equipment—Tabor Mfg. Co., 6225 Tacony street, Philadelphia. A catalog describing foundry machines and equipment, such as flask lift machines, squeezers and jar squeezers, jarring machines, and roll-over machines.

Metal Plumbing Ware—Grace & Bement Inc., Detroit. A brochure portraying development of formed metal plumbing ware and the important part it is playing in bringing new style appeals and colors to bathrooms and kitchens, entitled "Personal Luxury in the Bathroom and Kitchen."

Dust Control — Pangborn Corp., Hagerstown, Md. A booklet on "Industrial Dust Control Through Exhaust Systems." Charts progress made by various types of dust collecting systems and outlines advantages modern dust control brings to industry today.

Crane Bearings—SKF Industries Inc., Front street and Erie avenue, Philadelphia. Bulletin No. 236-3S-5-36, illustrating, as an aid to preliminary design, the latest and most up-to-date typical bearing design for cranes, also a description of shaft and housing fits.

Transformers — American Transformer Co., 178 Emmet street, Newark, N. J. Catalog No. 166, covering the complete line of AmerTran distribution transformers, for pole, platform, vault, and subway service, described and illustrated; gives standard voltage ratings and kilovolt-ampere sizes.

Controller—Bristol Co., Waterbury, Conn., has issued a new bulletin No. 444, describing the new model 90 pneumatic type controller for temperature, liquid level and pressure; information concerning application of the controllers with drilling dimensions, etc.

Nickel Alloy Steels—International Nickel Co. Inc., 67 Wall street, New York. Pamphlet listing the number and locations of warehouse distributors carrying nickel alloy steels in stock; also to acquaint the metal consuming industries with the nickel alloy steel compositions and sizes, now carried by warehouses.

Filters—George P. Dempler Co., 3318 Layonia avenue, Pittsburgh. A folder illustrating the Cuno mechanically cleaned filters, for straining water for descaling sprays, roll body coolant, power plant condensers, and other jobs where a no-water-loss, low pressure drop, mechanically-cleaned filter is required.

Rotary Grinders—Cleveland Pneumatic Tool Co., 3734 East 78th street, Cleveland. Bulletin No. 80 describing rotary grinders developed around the precisely engineered and accurately made Cleco rotary motor, essential parts of which are the 4-blade rotor, concentric with the arbor, and the economically renewable cylinder bushing.

Alloys and Overlay Metals—Colmonoy Co., Los Nietos, Calif. Bulletin No. 50, on heretofore unknown metallic crystals, insoluble in hot or cold acid or alkali solutions; do not oxidize even at high temperatures, have a hardness of approximately 9 on Moh's scale and retain their identity when they come in contact with fused metals.

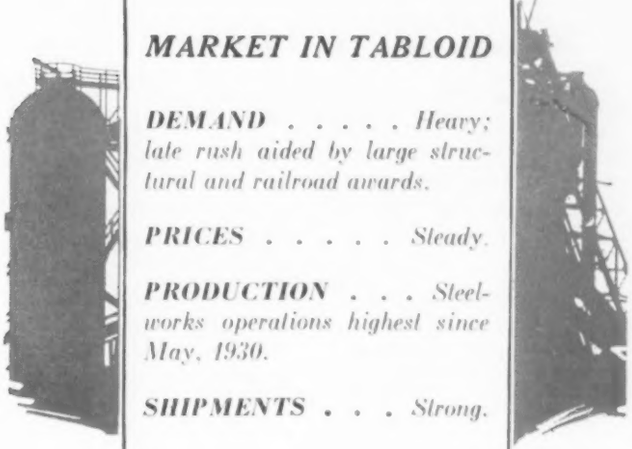
Hydrogen Sulphide Detector—Mine Safety Appliances Co., Pittsburgh. Bulletin No. DY-2, describing a hand-operated instrument for quick, accurate detection and measurement of low but dangerous concentrations of hydrogen sulphide; consists essentially of an aspirator tube, and a movable scale graduated to read directly in per cent of hydrogen sulphide.

Electric Metal Heaters—American Car & Foundry Co., 30 Church street, New York. A pamphlet on Berwick electric metal heaters, type "L" and "LA", equipped with electric eyes for temperature control; savings from fuel, compressed air, worn and broken dies, overheated and underheated material is claimed to amount to 50 to 70 per cent.

Power Transmission Equipment—Link-Belt Co., Chicago. A new list-price catalog devoted to power transmission equipment; featuring the recently announced line of Link-Belt Shafer self-aligning, anti-friction, roller bearing units, as well as a new group of babbitted bearings, an additional design of friction clutch, several new types of take-ups and other allied products.

Operating Rate Rises 1 Point to 71½ Per Cent

Third-Quarter Price Increases Bring Late Bulge in Orders



MARKET IN TABLOID

DEMAND . . . . . *Heavy; late rush aided by large structural and railroad awards.*

PRICES . . . . . *Steady.*

PRODUCTION . . . *Steelworks operations highest since May, 1930.*

SHIPMENTS . . . *Strong.*

STEELWORKS operations in the final week of June set a new 1936 record, reaching the highest rate since May, 1930, under a rush of last minute orders from customers desirous of escaping the third-quarter increase in prices.

Large orders for structural steel and railroad car construction were among major factors in the 1-point rise of the national operating rate to 71½ per cent. Producers will enter the third quarter with a large accumulation of specifications to cushion the tapering-off in July. This week operations will decline because of the July 4 holiday.

Operations have maintained an average of 62.6 per cent in the first six months of this year, compared with 47.1 per cent in the same period last year.

By a narrow margin, automobile assemblies dropped below the 100,000 mark for the first week since March 28. However, several manufacturers thought to have completed purchases of material for this season, placed orders for additional steel. Ford placed specifications for 30,000 cars and Chevrolet came into the market for steel for 23,000. Assemblies last week were off 1038 units from the previous week to 99,695.

Shape awards totaled 39,340 tons, up 11,860 from the previous week. Railroad car construction included the placing of 4720 cars, 1000 steel underframes and six locomotives. Last week's awards were the best since the week ending May 23, when 6900 freight cars were awarded.

After seven consecutive weeks at full 100 per cent of capacity, tin plate producers see no sign of seriously reduced activity. Some mills are three to four weeks behind on shipments of hot-rolled plate and about seven weeks in arrears on cold-rolled.

Leading strip producers last week began declining additional orders at second-quarter prices as heavy backlogs piled up. The need for rebuilding semifinished stocks, which have been drawn upon heavily, became more apparent.

Although orders for sheets showed a slight decline because many mills closed their books on second-quarter business, deliveries against contracts will be extended well into July. One leading producer reported 75 per cent of the orders placed during the first three weeks of June had been for current consumption. Eastern mills noted only a small amount of buying at third-quarter prices.

With by-product ovens hard pressed to fill the demand for coke, beehive producers anticipate a marked increase in their business soon. In two instances recently buyers have placed large tonnages for beehive because their own by-product capacity was fully engaged.

STEEL's survey of the first half of 1936 shows that in most products the record of the first half of 1930 was almost equaled. Steel for freight car awards was about 200,000 tons ahead of 1935; shape awards were up 33 per cent; steel rail orders 77 per cent; ingot output 33 per cent, and auto production 9 per cent.

May imports of iron and steel products totaled 59,391 gross tons, compared with 49,621 in April and 47,719 in May, 1935.

The market tone of scrap last week was slightly stronger, although the scrap index remained at $12.47 for the third straight week. STEEL's iron and steel composite was up 2 cents to $32.79 while the finished steel index remained at $52.20.

Operations in the Youngstown district were up 2 points to 80 per cent last week; eastern Pennsylvania 1½ to 47; Birmingham 4 to 58½; Cincinnati 4 to 80 and Cleveland 2½ to 84½. Pittsburgh declined 1 point to 66, New England 3 to 80 and the others were unchanged.

COMPOSITE MARKET AVERAGES

	June 27	June 20	June 13	One Month Ago May, 1936	Three Months Ago March, 1936	One Year Ago June, 1935	Five Years Ago June, 1931
Iron and Steel	$32.79	$32.77	$32.77	$32.92	$33.20	$32.42	$30.82
Finished Steel	52.20	52.20	52.20	52.20	52.32	54.00	48.60
Steelworks Scrap	12.47	12.47	12.47	13.40	14.48	10.45	8.84

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	June 27, 1936	May 1936	March 1936	June 1935
Steel bars, Pittsburgh	1.85c	1.85c	1.85c	1.80c
Steel bars, Chicago	1.90	1.90	1.90	1.85
Steel bars, Philadelphia	2.16	2.16	2.16	2.11
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.01½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.99
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.40	2.40	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts.	2.10	2.10	2.15	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.50	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.50	28.00
Billets, open-hearth, Pittsburgh	28.00	28.00	28.40	27.00
Wire rods, Pittsburgh	38.00	38.00	39.00	38.00

Pig Iron

	June 27, 1936	May 1936	March 1936	June 1935
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.81
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	20.2007	20.2007	20.2007	19.38
No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67

Scrap

Heavy melting steel, Pittsburgh	$13.50	$14.75	$15.75	$12.25
Heavy melt. steel, No. 2, east Pa.	10.75	11.71	12.55	9.30
Heavy melting steel, Chicago	12.75	13.05	14.75	10.25
Rail for rolling, Chicago	14.00	14.65	15.75	11.25
Railroad steel specialties, Chicago	14.75	14.65	16.25	11.75

Coke

Connellsville, furnace, ovens	$3.50	$3.50	$3.50	$3.50
Connellsville, foundry, ovens	4.25	4.25	4.10	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Prices are for third quarter, including increases on sheets, shapes, plates, bars, piling, hot strip, bolts, nuts, rivets and semifinished steel, effective July 1.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.95c
Gary	2.05c
Chicago, delivered	2.08c
Detroit, del.	2.15c
New York, del.	2.30c
Philadelphia, del.	2.26c
Birmingham	2.10c
St. Louis, del.	2.28c
Pacific ports, f.o.b. cars, dock	2.50c

Hot Rolled Annealed No. 24

Pittsburgh	2.50c
Gary	2.60c
Chicago, delivered	2.63c
Detroit, delivered	2.70c
New York, del.	2.85c
Philadelphia, del	2.81c
Birmingham	2.65c
St. Louis, del	2.82c
Pacific ports, f.o.b. cars, dock	3.15c

Galvanized No. 24

Pittsburgh	3.20c
Gary	3.30c
Chicago, delivered	3.33c
Philadelphia, del.	3.51c
New York, del.	3.55c
Birmingham	3.35c
St. Louis, del.	3.53c
Pacific ports, f.o.b. cars, dock	3.80c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.60c
Gary	2.70c
Detroit, delivered	2.80c
Philadelphia, del.	2.91c
New York, del.	2.95c
Pacific ports, f.o.b. cars, dock	3.20c

Cold Rolled No. 20

Pittsburgh	3.05c
Gary	3.15c
Detroit, delivered	3.25c
Philadelphia, del.	3.36c
New York, del.	3.40c

Enameling Sheets

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	3.05c
Gary, No. 10	2.55c
Gary, No. 20	3.15c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.50c
Do., Gary	3.60c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.90c
New York, del.	2.19c
Philadelphia, del.	2.09c
Boston, delivered	2.32c
Buffalo, delivered	2.15c
Chicago or Gary	1.95c
Cleveland, del.	2.09½c
Birmingham	2.05c
Coatesville, base	2.00c
Sparrows Pt., base	2.00c
Pacific ports, f.o.b. cars, dock	2.45c
St. Louis, delivered	2.18c

Structural Shapes

Pittsburgh	1.90c
Philadelphia, del.	2.11½c
New York, del.	2.16½c
Boston, delivered	2.30½c
Bethlehem	2.00c
Chicago	1.95c
Cleveland, del	2.10c
Buffalo	2.00c
Gulf Ports	2.30c
Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.45c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	1.95c
Chicago or Gary	2.00c
Duluth	2.10c
Birmingham	2.10c
Cleveland	2.00c
Buffalo	2.05c
Detroit, delivered	2.10c
Pacific ports, f.o.b. cars, dock	2.50c
Philadelphia, del.	2.26c
Boston, delivered	2.37c
New York, del	2.30c
Pitts., forg. qual.	2.20c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.80c
Chicago or Gary	1.85c
Moline, Ill.	1.85c
Cleveland	1.85c
Buffalo	1.90c

Iron

Terre Haute, Ind...	1.85c
Chicago	1.90c
Philadelphia	2.16c
Pittsburgh, refined..	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.....	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.....	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Stand. wire nails....	2.10c
Cement c't'd nails....	2.10c
Galv. nails, 15 gage and finer	4.10c
do. finer than 15 ga.	4.60c

(Per pound)

Polished staples.....	2.80c
Galv. fence staples	3.05c
Barbed wire, galv...	2.60c
Annealed fence wire	2.65c
Galv. fence wire.....	3.00c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 ga..	2.40c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.05c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.25c
20,000 to 59,999 lbs.	2.20c
60,000 to 99,999 lbs.....	2.15c
100,000 lbs. and over.....2.12½c	

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons.*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring .....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9200 spring flats .....base
9200 spring rounds, squares 0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/16-in. Pittsburgh	1.95c
Chicago or Gary..	2.05c
Birmingham base	2.00c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del....	2.30c
Cooperage hoop, Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.50 carbon and under, Pitts., Cleveland..	2.60c
Detroit, del.	2.81c
Worcester, Mass..	2.80c

Carbon	Pitts.	Cleveland, Birm., Young	Worcester, Mass.
0.25—0.50....	2.60c	2.80c	2.80c
0.51—0.75....	3.45c	3.65c	
0.76—1.00....	4.95c	5.15c	
Over 1.00....	6.50c	6.70c	

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi....	$35.00
Do., reroll. qual....	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel.....	2.10c
Spikes, R. R. base..	2.60c
Track bolts, base....	3.60c
Tie plates, base.....	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller.....70-10 off	
Do. larger .....70-5 off	
Tire bolts .....50 off	

Plow Bolts

All sizes .....70-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts .....65 off	
Elevator bolts .....65 off	

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch.....60-20-15 off	
Do., ½ to 1-inch....60-20-15 off	
Do., over 1-inch....60-20-15 off	

Hexagon Cap Screws

Milled .....80-10-10 off	
Upset, 1-in., smaller .....85 off	

Square Head Set Screws

Upset, 1-in., smaller.....75-10 off	
Headless set screws .....75 off	

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
7/8-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs....	$3.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do., under 5 kegs; no disc. on size extras.....	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	62	53½
2½—3	65	56½
3½—6	67	58½
7 and 8	66	56½
9 and 10	65½	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

⅛, butt weld	56
¼ and ⅜, butt weld	59
½, butt weld	63½
¾, butt weld	66½
1 to 3, butt weld	68½
2, lap weld	61
2½ to 3, lap weld	64
3½ to 6, lap weld	66
7 and 8, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.....	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham...	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago..	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B Stnd. fitgs., Birm. base..$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo & Young.	$30.00
Philadelphia	36.67
Duluth	32.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.....	37.00
Forging, Duluth	39.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	30.00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to 15/32-inch	40.00
Do., over 15/32 to 47/64-inch	42.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point....	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.....	$3.50- 3.65
Connellsville, fdry....	4.25- 4.35
Connel, prem. fdry.	5.35- 5.50
New River fdry.....	6.00
Wise county fdry....	4.45- 5.00
Wise county fur.....	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	5.00
Chicago, del.	9.75
New England, del....	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol.....	18.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)..	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lbs. Atlantic seaboard

Sulphate of ammonia.....	$1.25

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25
St. Louis, northern	20.00	20.00	19.50	.....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†19.68	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1. per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo., Ky.	$45.00
Alabama, Georgia	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Georgia, Alabama	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$15.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	18.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.56
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all-rail	$18.00
Do., for barge	$19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti., base	75.00
Do., del. Pittsb'gh	80.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30- 1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
June 20	9.50	9.62½	9.12½	41.75	41.35	4.60	4.45	4.85	*19.00	13.00	35.00
June 22	9.50	9.62½	9.12½	42.00	41.37½	4.60	4.45	4.85	*19.00	13.00	35.00
June 23	9.50	9.62½	9.12½	42.60	41.75	4.60	4.45	4.85	*19.00	13.00	35.00
June 24	9.50	9.62½	9.12½	42.75	41.85	4.60	4.45	4.85	*19.00	13.00	35.00
June 25	9.50	9.62½	9.12½	41.50	40.70	4.60	4.45	4.85	*19.00	13.00	35.00
June 26	9.50	9.62½	9.12½	40.37½	39.70	4.60	4.45	4.85	*19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper

Sheets	
Yellow brass (high)	15.12½
Copper, hot rolled	17.00
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	17.37½
Seamless copper	17.50
Rods	
High yellow brass	13.12½
Copper, hot rolled	13.75
Anodes	
Copper, untrimmed	14.50
Wire	
Yellow brass (high)	15.37½

OLD METALS

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	6.00- 6.25
Cleveland	6.25- 6.50
Chicago	5.75- 6.00
St. Louis	6.00- 6.25
Heavy Copper and Wire	
New York, No. 1	7.50- 7.75
*Chicago, No. 1	7.12½-7.37½
Cleveland	6.75- 7.00
St. Louis, No. 1	7.00- 7.50
Composition Brass Borings	
New York	5.75- 6.00
Light Copper	
New York	6.12½- 6.25
*Chicago	5.75- 6.00
Cleveland	5.75- 6.00
St. Louis	5.50- 6.00
Light Brass	
Chicago	3.50- 3.62½
Cleveland	3.25- 3.50
St. Louis	3.25- 3.75
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.25- 3.50
St. Louis	3.25- 3.75
Zinc	
New York	2.50- 2.75
Cleveland	2.25- 2.50
St. Louis	2.25- 2.75
Aluminum	
Borings, Cleveland	8.00- 8.50
Mixed, cast, Cleve.	11.75-12.00
Mixed, cast, St. L.	12.25-12.75
Clips, soft, Cleve.	13.75-14.00
SECONDARY METALS	
Brass ingot, 85-5-5-5	9.50
*Stand. No. 12 alum.	16.25-17.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Bos. d'ck, exp, brok.	10.50
N. Eng. del. No. 1	9.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	12.50-13.00
Cleveland, No. 1	13.00-13.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1	10.00-10.50
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	10.75-11.00
Federal, Ill.	10.75-11.25
Granite City, R. R.	12.25-12.75
Granite City, No. 2	9.00- 9.50
N. Y., brokers, No. 2	7.25- 7.75
N. Y., brokers, docks (No. 1 for export)	9.50
Pitts., No. 1 (R. R.)	14.00-14.50
Pitts., No. 1 (dlr.)	13.25-13.75
Pittsburgh, No. 2	12.25-12.75
St. Louis	11.00-11.50
Toronto, dealers	7.50
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	11.00-11.50
Chicago, factory	11.50-12.00
Chicago, dealer	11.00-11.50
Cleveland	12.75-13.25
Detroit	10.50-11.00
E. Pa., new mat.	11.50
Pittsburgh	13.25-13.75
St. Louis	7.75- 8.25
Valleys, No. 1	13.00-13.50

BUNDLED SHEETS

Buffalo	10.00-10.50
Cincinnati, del	7.75- 8.25
Cleveland	9.00- 9.50
Pittsburgh	12.50-13.00
St. Louis	6.25- 6.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	5.75- 6.25
Detroit	7.00- 7.50
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	15.50-16.00
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	14.00-14.50
Detroit	14.50-15.00
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft. & less	15.25-15.75

STEEL RAILS, SCRAP

Boston, brokers	7.50- 7.75
Chicago	12.50-13.00
Pittsburgh	14.00-14.50
St. Louis	12.50-13.00
Buffalo	12.50-13.00
Toronto, dealers	8.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, brokers	5.00- 5.25
Buffalo	10.00-10.50
Chicago	7.50- 8.00
Cincinnati, dealers	7.75- 8.50
Detroit, net	9.00- 9.50
Eastern Pa.	10.00-10.50
N. Y., brokers, fdry.	7.00- 7.25
St. Louis	7.50- 8.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	14.75-15.25
Chicago, springs	14.50-15.00
Eastern Pa.	16.00-16.50
Pittsburgh	16.50-17.00
St. Louis	13.25-13.75

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.75-13.25
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	14.50-15.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.75-15.25
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops	16.00
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	15.00-15.50

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	12.50-13.00

SHOVELING STEEL

Chicago	12.50-13.00
Federal, Ill.	10.50-11.00
Granite City, Ill.	10.00-10.50
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, brokers	7.25- 7.50
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	12.50-13.00
Chicago, No. 1, net	12.50-13.00
Chicago, No. 2	12.50-13.00
Cincinnati, No. 2	10.00-10.50
Eastern Pa.	13.50-14.00
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	11.75-12.25
Toronto, No. 1, dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	11.50-12.00
New York, brokers	7.50- 7.75

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	11.50-12.00
Cinci., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	4.50- 5.00
Cleveland, No. 2	8.25- 8.75
Detroit No. 1, new	9.50-10.00
Valleys, new, No. 1	12.75-13.00
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	5.00- 6.00
Boston, brokers	3.00- 3.25
Buffalo	6.50- 7.00
Chicago	6.00- 6.50
Cincinnati, dealers	5.75- 6.25
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	7.50
New York, brokers	3.50- 3.75
Pittsburgh	9.50-10.00
St. Louis	4.00- 4.50
Toronto, dealers	4.00
Valleys	9.50- 9.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, brokers	2.00
Buffalo	8.50- 9.00
Cincinnati, dealers	5.25- 5.75
Cleveland	8.25- 8.75
Detroit	6.50- 7.00
Eastern Pa.	5.75- 6.50
New York, brokers	2.25- 2.50
Pittsburgh	8.00- 8.50
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham, plain	4.00- 5.00
Boston, chem. brok.	6.00- 6.25
Boston, brokers	3.50- 4.00
Buffalo	8.00- 8.50
Chicago, dealers	6.00
Cincinnati, dealers	5.00- 5.50
Cleveland	8.25- 8.75
Detroit	6.50- 7.00
E. Pa., chemical	10.00-13.00
New York, brokers	4.25- 4.50
St. Louis	4.00- 4.50
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers	7.75- 8.25
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	10.50-11.00
Chicago, net	8.25- 8.75
Cincinnati	7.00- 7.50
Eastern Pa.	10.00-10.50
New York, brokers	6.00- 6.25
St. Louis	7.50- 8.00

FORGE FLASHINGS

Boston, brokers	6.25- 6.50
Buffalo	11.00-11.50
Cleveland	11.50-12.00
Detroit	9.00- 9.50
Pittsburgh	12.25-12.75

FORGE SCRAP

Boston, brokers	5.50- 6.00
Chicago, heavy	14.00-14.50
Eastern Pa.	12.00-12.50

ARCH BARS, TRANSOMS

St. Louis	13.50-14.00

AXLE TURNINGS

Boston, brokers	5.75- 6.00
Buffalo	11.00-11.50
Chicago, elec. fur.	12.75-13.25
Eastern Pa.	11.00-12.00
St. Louis	9.00- 9.50
Toronto	4.50

STEEL CAR AXLES

Birmingham	11.50-12.50
Boston, brokers	11.00-11.25
Buffalo	15.50-16.00
Chicago, net	14.50-15.00
Eastern Pa.	17.00
St. Louis	13.00-13.50
Toronto	8.50

SHAFTING

Boston, brokers	13.25-13.50
Eastern Pa.	18.50
New York, brokers	13.50-14.00
St. Louis	13.50-14.00

CAR WHEELS

Birmingham	11.00-11.50
Boston, iron, brok.	7.50- 7.75
Buffalo, iron	13.50-14.00
Buffalo, steel	15.50-16.00
Chicago, iron	13.25-13.75
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	10.50-11.00
Eastern Pa., iron	13.50-14.00
Eastern Pa., steel	16.00-16.50
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	16.50-17.00
St. Louis, iron	11.50-12.00
St. Louis, steel	13.00-13.50
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	10.50-11.50
Boston, No. 1 mach. brokers	8.75- 9.00
N. Eng., del. No. 2	9.50-10.00
N. Eng. del. textile	11.00-11.50
Buffalo, cupola	11.50-12.00
Buffalo, mach.	12.50-13.00
Chicago, agri. net	10.00-10.50
Chicago, auto	11.00-11.50
Chicago, mach. net	12.00-12.50
Chicago, railr'd net	11.00-11.50
Cinci., mach. cup	10.75-11.25
Cleveland, mach.	15.25-15.75
Eastern Pa., cupola	13.50-14.00
E. Pa., mixed yard	11.00-11.50
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	11.00-11.50
St. L., No. 1 mach.	11.50-12.00
Toronto, No. 1, mach., net	9.00

HEAVY CAST

New England del.	9.50-10.00
Buffalo, break.	10.25-10.75
Cleveland, break	12.50-13.00
Detroit, No. 1 mach. net	13.00-13.50
Detroit, break.	11.00-11.50
Detroit, auto net	11.00-11.50
Eastern Pa.	12.50-13.00
New York, break. brokers	8.50- 9.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	11.50-12.50
New England del.	15.00-16.00
Buffalo	15.50-16.00
Chicago, R. R.	15.50-16.00
Cincinnati, agri. del.	12.50-13.00
Cleveland, rail	16.25-16.75
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	16.00-16.50
Pittsburgh, rail	17.00-17.50
St. Louis, R. R.	13.00-13.50
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	11.50-12.50
Boston, brokers	9.00- 9.50
Buffalo	12.50-13.00
Chicago	13.75-14.25
Eastern Pa.	15.00-15.50
New York, brokers	9.50-10.00
St. Louis	14.25-14.75

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	14.75-15.25
Chicago	15.00-15.50
Eastern Pa.	16.00-16.50
Pittsburgh (heavy)	16.50-17.00
Pittsburgh (light)	15.50-16.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 50-52%	26.00
So. African, 50-52%	26.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.00c
Boston††	3.10c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.11c-3.26c
New Orleans	3.35c
New York‡ (d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.50c
San Francisco	3.25c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.25c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.37c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.50c
San Francisco	3.25c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York‡(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh (h)	3.15c
Portland	3.35c
San Francisco	3.25c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.75c
Milwaukee	3.16c
New Orleans	3.55c
New York‡(d)	3.31c
Portland	3.35c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.35c
Seattle	3.70c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York‡(d)	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.10c
San Francisco	4.00c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.00c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.40c
Milwaukee	4.66c
New Orleans	4.95c
New York‡(d)	4.30c
Philadelphia*†	4.40c
Pitts.** (h)	4.15c-4.45c
Portland	4.50c
San Francisco	4.50c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York‡(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston††	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York‡(d)	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL

Baltimore (c)	3.73c
Boston	3.90c
Buffalo (h)	3.55c
Chattanooga*	4.13c
Chicago (h)	3.50c
Cincinnati	3.72c
Cleveland (h)	3.50c
Detroit	3.79c
Los Ang. (f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York‡(d)	3.81c
Philadelphia	3.76c
Pittsburgh	4.50c
Portland (f) (d)	6.15c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.15c
St. Louis	3.75c
St. Paul	4.02c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	2.85c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts. under; 15,000 to 39,999 lbs., 35 cts. under; 40,000 lbs. and over, 50 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 25

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.69 3 2 6*	$13.86	1 15 0
Basic bessemer	15.69 3 2 6*	11.89	1 10 0
Hematite, Phos. .03-.05	17.82 3 11 0	.....	.....
SEMIFINISHED STEEL			
Billets	$29.49 5 17 6	$18.61	2 7 0
Wire rods, No. 5 gage	44.93 8 19 0	35.65	4 10 0
FINISHED STEEL			
Standard rails	$41.42 8 5 0	$43.57	5 10 0
Merchant bars	1.74c 7 15 0	1.12c to 1.16c	3 2 6 to 3 5 0
Structural shapes	1.68c 7 10 0	1.11c	3 1 6
Plates, †¼ in. or 5 mm.	1.81c 8 1 3	1.53c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.18c 9 15 0	2.08c	5 16 0††
Sheets, gal., 24 gage, corr.	2.63c 11 15 0	2.15c	6 0 0
Bands and strips	1.96c 8 15 0	1.43c	4 0 0
Plain wire, base	2.18c 9 15 0	1.89c	5 5 0
Galvanized wire, base	2.58c 11 10 0	2.10c	5 17 6
Wire nails, base	2.69c 12 0 0	1.71c	4 15 0
Tin plate, box 108 lbs.	$ 4.71 0 18 9	.....	.....

British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$17.57	3 10 0(a)	$17.16	260	$13.87	410	$25.38	63
Basic bessemer pig iron	18.20	3 12 6(a)	12.54	190	11.84	350	28.00(b)	69.50
Furnace coke	5.65	1 2 6	6.27	95	4.13	122	7.66	19
Billets	29.49	5 17 6	28.38	430	18.77	555	38.88	96.50
Standard rails	1.85c	8 5 0	2.30c	671	1.53c	1,000	2.40c	132
Merchant bars	2.03c	9 1 0	1.67c	560	.99c	650	2.00c	110
Structural shapes	1.96c	8 15 0	1.64c	550	.99c	650	1.95c	107
Plates, †¼-in. or 5 mm.	2.03c	9 1 3	2.09c	700	1.22c	800	2.32c	127
Sheets, black	2.58c	11 10 0§	1.78c	600‡	1.35c	875‡	2.63c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.02c	13 10 0	2.84c	950	2.30c	1,500	6.76c	370
Plain wire	2.18c	9 15 0	2.84c	950	1.76c	1,150	3.16c	173
Bands and strips	2.20c	9 16 0	1.98c	650	1.22c	800	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 62.64 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—Producers of both carbon and alloy steel bars have begun to issue a number of higher quotations on several inquiries for July delivery. Inasmuch as June bar buying was at probably the heaviest rate for any month this year, enough material probably exists on order, in transit, and in most consumers' stocks to preclude a severe test to the higher market until at least the second week of July.

Cleveland—Bar market continues strong. The recent price advance has brought increased tonnage from small consumers. Auto partsmakers show little interest in stocking up. July 1 has been generally accepted as the deadline for orders placed at current prices. Alloy steel bars are more than holding their own in the increasing market demand.

Chicago—Backlogs will permit bar producers to continue heavy operations through most of July. While speculative demand has been responsible for much of the bulge in orders, consumption remains heavy among most large users. Automotive requirements have been maintained better than was anticipated, but speculative orders from this industry have been relatively smaller than those from the majority of buyers. Jobbers and cold bar finishers have been active in specifying. Farm implement, tractor and road machinery manufacturers continue to operate at a high rate.

Philadelphia—Sellers of bars for manufacturing purposes have experienced one of the best weeks this year, if not the best, as consumers seek coverage against the impending advance of $2 a ton on commercial and hot alloy bars and $3 a ton on cold-finished bars. The new price on commercial steel bars will be 1.95c Pittsburgh, or 2.26c Philadelphia.

Boston—Steel bars continue to be sold here at 1.85c, base, Pittsburgh, for shipment at mills' convenience. On the whole there is not a great deal of buying in anticipation of the advance to 1.95c scheduled for July 1. Indications are that the carryover of tonnage at the present price will be pretty much cleaned up by about July 15. In fact, most mills are shipping promptly against orders.

Cold Finished

Cold Finished Prices, Page 71

Pittsburgh — Specifications for cold-drawn carbon steel bars are being accepted by producers up through June 30 for shipment in July at the 2.10c, Pittsburgh, base. On all tonnage not entered before that time the advanced market of 2.25c, Pittsburgh, will apply. Most large buyers have already entered specifications and yet little material is going into speculative stock. Analysis of present buying reveals a wide diversity of users, which will be augmented shortly by revived tonnage buying by the automotive industry for 1937 models.

Plates

Plate Prices, Page 70

Pittsburgh—Activity for marine equipment is still a highlight in the plate market, and railroad car shops are active inquirers. Algiers Public Service Co., New Orleans, is asking bids to close July 7 for construction of a steel hull twin screw ferry boat, 150 x 54 feet. The company will furnish the motive power. Bethlehem Steel Co. will launch this week from its Leetsdale, Pa., yards the first steel barge of a fleet of eight being built for the Rivers Terminal Corp., New Orleans. Jones & Laughlin Steel Corp., Pittsburgh, has launched a tank barge for Producers Pipe Line Co. Inc., Owensboro, Ky. The barge required approximately 185 tons of plates and shapes and is 165 x 35 x 10 feet.

Cleveland—Small plate fabricators report heavy total consumption. One claims to have the best second quarter since 1929. Third quarter outlook is indefinite. The recent price advance has not brought the expected spurt. One of the many reasons given is the high handling costs.

Chicago—Plates continue active as a result of increasing consumption by tank and structural fabricators, freight car builders and miscellaneous users, and increased coverage on specified projects in anticipation of the higher price effective July 1. In addition to the substantial tonnage already entered, additional business is in sight for various projects now pending. Tank fabricators expect to continue active operations through the summer. Plate shipments for freight car building during the ensuing quarter will show an increase over those of the past three months.

Boston—Increased demand for steel plates has been brought about by the impending increase from 1.90c to 2.00c, base, Coatesville, Pa., July 1. From a comparatively easy condition the market has tightened and in some instances consumers are having difficulty in getting deliveries soon enough to meet requirements.

Philadelphia—With plate sellers accepting orders at current prices until the end of this month, the past few days have witnessed some good protective covering. For some sellers last week has been one of the best this year. One feature has been an increase in the number of identified jobs. Buyers will be allowed 30 days after June 30 to place orders at second quarter prices. July as well as being a better production month than originally expected will also see actual placing of substantial tonnage for identified jobs, tonnage which will be delivered as required during the life of the various jobs.

New York—With plate sellers accepting orders until the end of June at second quarter prices, good activity is noted. Protective covering is particularly noticeable in regard to identified work. Much of the tonnage of this character may not be closed until next month, inasmuch as 30-day period is granted, but the impending $2 advance has brought to an active stage a number of identified jobs, which otherwise might have dragged.

San Francisco—New projects calling for plates are slow in coming forth and pending business does not exceed 2000 tons. To date this year 93,553 tons have been placed as compared with only 21,847 tons for the corresponding period in 1935.

Seattle — Business is improving, particularly in small tonnages for tank and repair jobs. Everett, Wash., plans a $1,300,000 pipe line extension involving 130,380 feet of 48 and 52-inch mains. Bids are expected to be called within 60 days.

Contracts Placed

4500 tons, oil storage tanks, Shell Petroleum Corp., Houston, Tex., to unstated fabricator.

4325 tons, 11 tanks, Shell Petroleum Corp., Houston, Tex., to Chicago Bridge & Iron Works, Chicago.

590 tons, two tanks, Tide Water Oil Sales Co., South Portland, Me., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, four double hangars, Hickman Field, T. H., to unnamed interest.

355 tons, seven tanks, Solar Fuel Oil Co., Delawanna and Bayway, N. J., to Chicago Bridge & Iron Works, Chicago.

300 tons, including 100 tons shapes, for Inland Navigation Co.'s power barge, to Barde Steel Co., Seattle.

250 tons, 88 buoys, to Union Boiler & Mfg. Co., Lebanon, Pa., through superintendent of lighthouses, Washington.

170 tons, car plates, Haffner Thrall Car Co., Chicago Heights, Ill., to Jos. T. Ryerson & Son Inc., Chicago.

150 tons, oil storage tanks at The Dalles, Oreg., for Inland Navigation Co., to Barde Steel Co., Seattle.

130 tons, elevated tank, Barnstable, Mass., to Chicago Bridge & Iron Works, Chicago.

Unstated, three oil storage tanks for General Petroleum Co., Seattle, to unnamed San Francisco plant.

Contracts Pending

6000 tons, tunnel liners, Detroit sewers.

1000 tons, storage bins and tanks, Lehigh, N. Dak.
430 tons, 28 to 44-inch welded steel pipe, Contract No. 107, San Francisco; bids opened.
442 tons, siphons No. 1 and No. 2, Vasquez Creek tunnel project, Denver; Thompson Mfg. Co., Denver, low.
300 tons, steel dredge pipe, contract B, Metropolitan district water supply commission, Boston; bids July 2.
Unstated, reclamation tunnel, Yakima, Wash., project; Morrison-Knudsen Co., Boise, Idaho; general contractor.
Unstated, water tank, Salem, Oreg., system extension; bids soon.
Unstated 130,380 feet of 48 and 52-inch water pipe for Everett, Wash., system-expansion; bids soon.

Sheets

Sheet Prices, Page 70

Pittsburgh—Orders for sheets over the past week have declined slightly, due to efforts two weeks ago of many producers to announce June 20 as the deadline for specifications at second-quarter prices. However, actual needs of refrigerator makers, car roofing fabricators, manufacturers of steel drums and others in the last week have been the reason for no undue aggregate market decline. In addition, automotive inquiry of some importance for the first of 1937 parts is beginning to appear. June 30 is the deadline for acceptance of sheet business at second-quarter prices.

Cleveland—Majority of mills are out of the market at current prices and few will be able to complete shipments by July 1. Some orders have been taken at the $2 increase for third quarter. Automobile manufacturers have purchased little material at the current prices for stock, as they do not know what sizes for new models. Little speculative buying has been done.

Chicago—Sheet mills last week closed books on second quarter tonnage and are quoting higher prices announced a short time ago for third quarter delivery. Backlogs are heavy and despite capacity operations, deliveries against contracts necessarily will be extended through most of July. Little buying for 1937 automobile models has appeared, but shipments against previous orders are maintained at a better rate than had been anticipated 60 days ago.

Boston—The sheet market has been featured by some anticipatory buying in view of the $2 price advances scheduled for July 1. The principal purchases have involved galvanized sheets by jobbers and as a result these interests are laying in deliveries at 3.10c, base, Pittsburgh, which will last them well through third quarter on the average.

Philadelphia—Despite the fact a number of leading sellers withdrew from the market a week ago on tonnage at second quarter prices, considerable sheet business has since been placed. Last-minute buyers, seeking protection against third quarter prices, were able to close on sizable tonnage with the aid of some shopping around, and in some instances orders were placed late in the week at the new prices, where a favorable delivery could be obtained. Actual consumption of sheets is still heavy and is expected to continue so for a few weeks. Some producers of cold reduced sheets are now booked into August.

Buffalo — Sheet production in hand mills continues at 85 per cent of capacity, with this rate scheduled for the remainder of the quarter. Bethlehem's strip mill at Lackawanna will be opened for press inspection June 30. Business continues good in all sections of the sheet list.

Cincinnati—Sheet mills closed second quarter books nearly a week ago in decision to make effective promptly the $2 a ton advance for third quarter. A backlog of about two weeks in July is shown, so that the production drop will be cushioned. So far contracting for next quarter has been fair. Meanwhile rolling schedules are close to 100 per cent capacity.

Birmingham, Ala.—Sheet mills have maintained an active output for a long time and still have business in sufficient quantity to keep production at high level.

Seattle — Sheets lead other products, demand for corrugated being active for general tank and construction work. Improved turnover for private industrial jobs is noted although public works buying has declined.

Pipe

Pipe Prices, Page 71

Pittsburgh—The pipe market has quieted since the recent placing of the White Eagle 6-inch line and the Shell Union Oil Corp. 10 and 12-inch line, although several inquiries are still considered promising. Standard pipe is fairly active, based on new building and repair work. Specifications for oil country goods are a market highlight, and some increase has occurred in demand for boiler tubes.

Chicago—Shipments of cast pipe against orders remain fairly heavy. Awards are quieter, following placing of several large contracts, while inquiries also include few important lots. Prices continue steady.

Boston—Unusual activity is reflected in cast pipe. Eight new lettings aggregated around 1600 tons. In addition, many small orders are being placed, and pipe foundries are getting releases against old orders. A feature is the strength reflected in prices.

New York—Demand for cast pipe has taken a spurt. In addition to five new projects, aggregating some 900 tons, the pending list includes a large number of tonnages for private buyers. At least two of the latter involve more than 500 tons each. Much additional tonnage is slated to come up for figures soon. Prices are firm.

Birmingham, Ala. — Cast pipe shops are operating at better than three days a week. New lettings have bolstered backlogs, the far-West having placed business for more than 14,000 tons of various sizes. Several other awards are anticipated soon. Pipe makers are buying iron in small lots, and are not carrying much raw material on yards.

San Francisco—Although awards were confined to small lots, more than 15,000 tons are now pending. Los Angeles has just opened bids on 13,000 tons. Glendale, Calif., is taking bids on 409 tons of 6 to 12-inch.

Seattle—Demand for cast pipe continues to lag, with no large projects pending. Business in less than 100-ton lots is fair.

Cast Pipe Placed

6000 tons, for Cicero, Ill., to United States Pipe & Foundry Co., Burlington, N. J.
800 tons, Cotuit, Mass., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.
200 tons, 6 and 8-inch, Marlboro, Mass., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.
165 tons, Charlestown, N. H., to United States Pipe & Foundry Co., Burlington, N. J.
165 tons, East Hartford, Conn., to United States Pipe & Foundry Co., Burlington, N. J.
131 tons, Norwich, Conn., to United States Pipe & Foundry Co., Burlington, N. J.
100 tons, Allington Gas Light Co., Allington, Mass., to United States Pipe & Foundry Co., Burlington, N. J., through New England Power Co., Boston.

Cast Pipe Pending

13,000 tons, 6 to 24-inch, Los Angeles; United States Pipe & Foundry Co. low on 7000 tons, American Cast Iron Pipe Co. low on 3000 tons, National Cast Iron Pipe Co. low on 2000 tons, R. D. Wood & Co. low on 500 tons, and Pacific States Cast Iron Pipe Co. low on 500 tons.
109 tons, 8 and 1-inch, Glendale, Calif.; bids opened.
280 tons, 18 and 24-inch; Yonkers, N. Y.
180 tons, 30-inch, procurement division, treasury department, New York, for Freeport, N. Y.; United States Pipe & Foundry Co., Burlington, N. J., low.
175 tons, 20 and 24-inch; Yonkers, N. Y.
131 tons, sewage disposal, Rockland state hospital, Orangeburg, N. Y.; F. H. McGraw Co., New York, low.
127 tons, 4 to 16-inch, Brookline, Mass.; Warren Foundry & Pipe Corp., Phillipsburg, N. J., low.
125 tons, state hospital; Marcy, N. Y.
100 tons; Waterville, Me.

—The Market Week—

Transportation

Track Material Prices, Page 71

Award of 4720 freight cars, 1000 steel underframes and six locomotives in the past week makes this the best similar period since the week ending May 23 when a larger number were distributed to builders. Southern Pacific led with 2950 freight and 20 horse cars, Wheeling & Lake Erie 1000, Northern Pacific 750 and the Union Pacific 1000 steel underframes. Southern Pacific also placed six oil-burning locomotives.

Class I railroads on June 1 had more freight cars on order than at any time on this date since 1930, with 25,748 on order, compared with 1479 June 1, 1935.

Production of rails is tapering as backlogs are steadily reduced. Secondary rail buying has not developed to the expected extent but further tonnages are to come out soon from a number of important roads.

Cars Orders Placed

Northern Pacific, 500 gondolas to Pressed Steel Car Co., Pittsburgh; 250 cars to own shops.

Southern Pacific, 2970 cars: 500 steel boxcars each to Pressed Steel Car Co., Pittsburgh, Bethlehem Steel Co., Bethlehem, Pa., Pullman-Standard Car Mfg. Co., Chicago, 250 to American Car & Foundry Co., New York, 500 steel automobile cars to General American Transportation Co., Chicago, 250 to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; 20 horse cars to St. Louis Car Co., St. Louis; 200 flats, 100 gondolas and 150 stock cars to be built in its own shops.

Union Pacific, 1000 steel underframes to Ryan Car Co., Chicago.

Wheeling & Lake Erie, 1000 sixty-ton self-clearing steel hoppers; 500 each to Ralston Steel Car Co., Columbus, O., and Pullman-Standard Car Mfg. Co., Chicago.

Locomotives Placed

Southern Pacific, six streamlined oil-burning locomotives, to Lima Locomotive Works, Lima, O.

Buses Booked

Twin Coach Corp., Kent, O.: Twenty 23-passenger for Toronto Transportation Co., Toronto, Ont.; twelve 30 to 40-passenger for Los Angeles Railway Co., Los Angeles; nine 23-passenger for Northern Texas Traction Co., Fort Worth, Tex.; six 23-passenger for Dallas Railway & Terminal Co., Dallas, Tex.; five 23-passenger for New York State Railways, Utica, N. Y.; four 23-passenger for Motor Transit Co., Jacksonville, Fla.; four 23-passenger for Springfield Transportation Co., Springfield, Ill.; three 23-passenger for Mississippi Power & Light Co., Jackson, Miss.; three 30-passenger for Northern Texas Traction Co., Fort Worth, Tex.

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HIGH TEMPERATURE INSULATION

Strip Steel

Strip Prices, Page 71

Pittsburgh—Producers are entering July with large backlogs, fairly well spread between hot and cold-rolled grades, and next month's shipments will be ahead of the usual July showing. In hot-rolled strip the $2 a ton advance becomes effective after June 30, so that requirements in some quantity are now on producers' books awaiting shipment through the early part of July. Cold-rolled strip at 2.60c, base, Pittsburgh or Cleveland, is unchanged for next quarter.

Cleveland—Backlogs of strip producers are steadily mounting. The recent price increase on hot-rolled material has driven in considerable tonnage, in small lots. No large orders of any consequence were reported last week. Demand for cold-rolled strip has kept at a moderate pace without aid of a price advance.

Chicago—Heavy backlogs last week required strip producers to decline additional orders at second quarter prices, except in occasional instances. Hot strip production will continue at an active rate into July in view of orders now on books. Cold strip demand, while unaffected by speculative purchasing, has continued equal to or in excess of the May rate. Automotive specifications have consisted almost entirely of 1936 model material, with little business placed as yet for later models. Miscellaneous strip consumption is holding well. On new business, hot strip is quoted 2.05c, Chicago or Gary, with cold-rolled strip 2.60c, Pittsburgh or Cleveland.

Boston—With the July 1 advance of $2 a ton slated for hot-rolled strip steel there has been anticipatory buying on hot strip by cold rollers. This business was booked at 1.85c, base, Pittsburgh, for shipment at mills' convenience, which means promptly.

Philadelphia—Buying of hot strip has been the most active here in considerable time due to the announced $2 advance for third quarter. Consumers have had little difficulty obtaining protection. Cold-finished strip, which remains unchanged, has been in steady demand, with little fluctuation in many weeks.

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Cincinnati, Ohio

Wire

Wire Prices, Page 71

Pittsburgh — Demand for wire products has continued through the last week of June, although a decline is expected next month, especially in merchant items. Manufacturing wire probably will undergo some improvement toward the latter part of July, when automobile parts makers resume greater activity.

Cleveland — Needs of automobile producers are strong. However there is a feeling of uncertainty as to how long it will continue. The most encouraging feature is increasing demand from general manufacturing concerns. The seasonal decline in agricultural takings has set in. General price situation is firm and no change is contemplated.

Chicago—The manner in which wire demand is resisting the retarding influences common to this season is proving a surprise to producers. Whereas a short time ago a downward trend had been anticipated for June, the month is showing improvement over the previous 60 days. Automotive requirements have been better than was expected and miscellaneous users of manufacturers' wire have maintained steady or rising consumption. Backlogs of producers are moderate compared with those of steel products on which prices are being advanced. Plain wire continues 2.45c, Chicago, with wire nails $2.15 and wire rods $39 to $43.

Shapes

Structural Shape Prices, Page 70

New York—With the 1.90c base, Bethlehem, Pa., price on plain structural shapes scheduled to be displaced by 2.00c July 1, the dam that has held up a large amount of structural tonnage for some time seems to be breaking. Rush to get tonnage on the books at the old price seems to have started. The list of awards in addition to many smaller jobs included three large ones, involving 8000, 4700 and 1125 tons, respectively.

Pittsburgh—American Bridge Co. bid was low at approximately $2,139,000 on construction of the marine parkway superstructure, New York, requiring approximately 12,000 tons of fabricated structural steel. Frederick Snare Corp., New York, was low on the substructure for the same project. Mt. Vernon Bridge Co. has been announced low on the 5000-ton Ohio river bridge at Cairo, Ill. On inquiry are 3000 tons for construction of dam No. 21 at Quincy, Ill., July 28, and 2100 tons for dam No. 12 in the Mississippi river, Aug. 4. Plain structurals are quoted 1.80c, base, Pittsburgh, until July 1.

Cleveland—Bids are now out for a new hockey ring in Cleveland. This represents the largest single job since the stadium was finished in the summer of 1932. Total tonnage amounts to approximately 1200 tons. There are two inquiries out comprising a total of 350 to 400 tons for state grade crossing eliminations.

Chicago—Inquiries have increased substantially and fabricators have been busy obtaining price protection on material for various projects. The increase in orders for plain shapes points to relatively heavy production for several months. Pending work consists principally of bridges and river locks and dams.

Philadelphia—Although district work continues restricted, fabricating shops are increasing operations considerably, as a substantial tonnage is coming in from the outside. One eastern fabricator is expected, as a result, to resume operations at its Philadelphia plant soon.

Boston—Unusual activity continues. Sixteen new lettings involve a total of 2160 tons and there have been numerous small awards which add up to an impressive total. All shops are busy and some are having trouble giving desired delivery.

Seattle—While no jobs in excess of 100 tons were placed this week, new projects have developed involving considerable tonnages. Plans are out for 600 tons involved in a plant extension at Everett, Wash., for the Soundview Pulp Co., bids soon, and 400 tons for the St. Regis kraft

Birmingham, Ala.—Fabricating shops are busy and production is showing steadiness with reiteration of the statement that there is enough business on hand and in sight to warrant continued active operation for three months and longer. Bids are out on several sizable awards.

San Francisco—Awards this year involve more than twice the tonnage placed for the same period last year. Unnamed interests took 3500 tons in addition to 500 tons for floor work in four double hangars for Hickman Field.

Shape Awards Compared

	Tons
Week ended June 26	39,340
Week ended June 19	27,480
Week ended June 12	18,215
This week, 1935	21,342
Weekly average, 1935	17,081
Weekly average, 1936	20,628
Weekly average, May	20,117
Total to date, 1935	387,266
Total to date, 1936	536,349

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pulp mill at Tacoma, will be placed as soon as a labor dispute is settled.

Shape Contracts Placed

8000 tons, Rockefeller Center building, New York, to American Bridge Co., Pittsburgh, through Post & McCord Inc., New York.

4700 tons, west side elevated highway extension, 111th to 121st streets, New York, to American Bridge Co., Pittsburgh, through James Stewart & Co., New York.

1350 tons, sheet piling, Nuuano stream dam, T. H., to Bethlehem Steel Co., Bethlehem, Pa.

1125 tons, recreation center, Jersey City, N. J., to American Bridge Co., Pittsburgh.

1050 tons, plant addition, Carpenter Steel Co., Reading, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

1025 tons, bridge, Smith county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

1000 tons, bridge, Tyler, Tex., to North Texas Iron & Steel Co., Ft. Worth, Tex.

815 tons, bridge, Tarrant county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

800 tons, bridge, Ft. Worth Tex., to North Texas Iron & Steel Co., Ft. Worth, Tex.

800 tons, overpass, Okmulgee, Okla., to Capitol Steel & Iron Co., Oklahoma City, Okla.

750 tons, crusher plant, Climax Colo., to Kansas City Structural Steel Co., Kansas City, Mo.

750 tons, plant addition, Packard Electric Co., Warren, O., to Bethlehem Steel Co., Bethlehem, Pa.

740 tons, five bridges over New York Central railroad, New York, to Bethlehem Steel Co., Bethlehem, Pa.

710 tons, bridge for All-American canal project, California, to Virginia Bridge & Iron Co., Roanoke, Va.

700 tons, Seaview hospital, Staten Island, N. Y., to Dreier Structural Steel Co., New York.

700 tons, clubhouse and grandstand, auto speedway, Roosevelt Field, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Emund J. Rappoli, Cambridge, Mass.

690 tons, state highway bridge, Schuylkill county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.; Bates & Rogers, Construction Co., Chicago, general contractor at $302,727.95 on May 1 letting; included, 50 tons deformed steel bars.

670 tons, California state highway bridge over Southern Pacific and Western Pacific railroad tracks, Niles, Calif., to Moore Dry Dock Co., San Francisco.

525 tons, building for California Institute of Technology, Los Angeles, to Consolidated Steel Corp., Los Angeles.

480 tons, viaduct, Sacramento, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

458 tons, bridge in Park county, Wyoming, to unnamed interest.

440 tons, packing plant, Albert Lea, Minn., to Joseph T. Ryerson & Son Inc., Chicago.

425 tons, plant extension, Union Carbide & Carbon Co., Niagara Falls, N. Y., to American Bridge Co. Pittsburgh.

400 tons, high school building, Dunmore, Pa., to Anthracite Bridge Co., Scranton, Pa.

385 tons, state highway bridge, Douglas county, Kansas, to St. Joseph Structural Steel Co., St. Joseph, Mo.

365 tons, bridge, Hennepin county, Minnesota, to American Bridge Co., Pittsburgh.

360 tons, New York state highway grade crossing elimination, Schenectady, N. Y., to Phoenix Bridge Co., Phoenixville, Pa.

340 tons, lookout towers, Maryland, to Aeromotor Co., Chicago.

280 tons, state highway bridge, Swanton, Vt., to Bethlehem Steel Co., Bethlehem, Pa.

285 tons, power house for Rochester Gas & Electric Co., Rochester, N. Y., to Genesee Bridge Co., Rochester, N. Y.

270 tons, stadium, Jersey City, N. J., to Oltmer Iron Works, Jersey City, N. J.

265 tons, state highway bridge, Pike county, Missouri, to Illinois Steel Bridge Co., Jacksonville, Ill.

260 tons, lookout towers, various locations, for department of agriculture, to Aermotor Co., Chicago.

255 tons, alterations to Packard Electric Co. plant, Warren, O., to Truscon Steel Co., Youngstown, O.

255 tons, plant addition, Packard Electric Co., Warren, Pa., to Truscon Steel Co., Youngstown, O.

255 tons, bridge at Bozeman, Mont., to American Bridge Co., Pittsburgh.

250 tons, Inglewood boulevard bridge, Los Angeles, to Ingalls Iron Works Co., Birmingham, Ala.

250 tons, apartment, 187th street and Northern avenue, Bronx, N. Y., to Dreier Structural Steel Co., New York.

230 tons, plant addition, Viscose Co., Meadville Pa., to Bethlehem Steel Co., Bethlehem, Pa.

225 tons, bridge, Lake county, Indiana, to American Bridge Co., Pittsburgh.

225 tons, Ohio state highway bridge Delta., O., to Bethlehem Steel Co., Beth-

Behind the Scenes with STEEL

Great Legs Expo

AFTER the famous Chicago Century of Progress, the chant of kiddies on every street corner ran something like this: "Sally Rand has lost her fan; give it back you *nasty* man." In other words, Sally and the Chicago fair were just like ham and eggs, iron and steel, Amos 'n' Andy, etc.

Last Saturday, the Great Lakes Expo gates rattled open with the assistance of President Roosevelt, the light of the moon, the Dionne quintuplets and maybe a few others. After a hasty preliminary glance, we find our favorite exhibit is the adjacent Parka Girl who should easily destroy all memories of Sally Rand, and who already has moved the wags to dub the show the Great Legs Exposition.

The place of "female art" in business papers may be doubtful, but there is no real reason why the adjoining eyeful should not be an appealing decoration here.

Seriously, though, the Great Lakes show is highly recommended; for an authoritative preview, see page 18.

• • •

Roses for Remembrance

MORNING mail from Dayton, O., brought (in a business reply envelope, 4 cents postage due) a mess of crushed rose petals sprinkled through a mass of tangled roan-colored hair, the latter either human or horse.

There's probably a story there, but no details were given. Horsehair and roses! Go on, let your imagination wander. It's too much for us.

• • •

For Your Files

IN CASE you would like a few reprints of that article on welding metals without fusion which appeared in the June 22 issue of STEEL, drop a line to the Readers' Service Dept., 1213 West Third Street, Cleveland, and they will be supplied while they last.

Interest in Dr. Longoria's unique welding method is proving to be nationwide, every mail bringing in requests for more details. Unfortunately, the good Doctor himself is about the only source of information, and he's gone abroad. Won't be back until October.

• • •

Connection

TWO of the more recent movies, which apparently have had simultaneous release, are titled, "The King Steps Out" and "The Princess Comes Across", respectively. A note from our former artist, Mr. Etaoin, suggests the possibility of an epidemic of raised eyebrows as a result of the proximity of these titles.

Putting two and two together, with his accustomed facility, our artist friend, whose real name, by the way, is L. D. Bradbury and not Etaoin, has already laid sketchy plans for a new M-G-M super-epic, to be called "Scandal in Europa."

• • •

Question

WHEN people get curious about something they have read or have heard, they usually sit right down and write themselves a letter, but send it to us. And don't think some of these letters aren't sticklers. There have even been a few passed along to us by *Popular Mechanics* whose readers' service department must have given up in despair.

But we can take it, at least most of the time. However, a letter received the other day left us panting and dizzy. It read: "Kindly tell us who makes steel stairways for houses to live in." Parse that if you can.

• • •

Hey, Dough-Boys!

VETERANS who are still looking for some place to unload some of those recently delivered bonds and who are now associated with the iron, steel or metalworking industries, can't go wrong by investing in a two-year subscription to STEEL at the special-to-veterans rate of $6.

It's a long way to Tipperary, but it will seem like just around the corner if you have a copy of STEEL to read on the way.

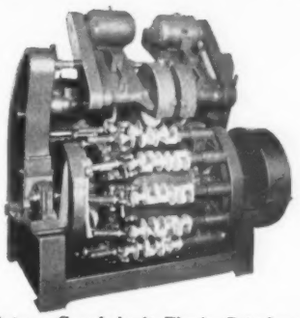
—SHRDLU

lehem, Pa.
220 tons, warehouse, McKesson & Robbins Co., Buffalo, to Ernst Iron Works, Buffalo.
200 tons, bus terminal, 60 West Fifty-first street, New York, to Dreier Structural Steel Co., New York, through Thomas Lamb, New York.
200 tons, St. Mary's church 132nd street and Convent avenue, Bronx, N. Y., to Dreier Structural Steel Co., New York.
200 tons, power house extension, Rochester Gas & Electric Corp., Rochester, N. Y., to Genesee Bridge Co., Rochester, N. Y.
200 tons, bridge, Tarrant county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.
200 tons, bus terminal, Eastern Massachusetts Street Railway Co., Boston, to New England Structural Co., Everett, Mass.
200 tons, memorial building, Holyoke, Mass., to Haarmann Steel Co., Holyoke, through Daniel O'Connell & Son, Holyoke.
190 tons, building, Notre Dame college, South Bend, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.
180 tons, bridge, Bastrop county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.
180 tons, Rawson avenue subway, Lake county, Wisconsin, to Wisconsin Bridge & Iron Co., Milwaukee.
175 tons, manufacturing building, East Stroudsburg, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.
170 tons, Friends school buildings, Wilmington, Del., to Bethlehem Fabricators Inc., Bethlehem, Pa.
165 tons, Neponsit Beach hospital, Rockaway, N. Y., to Dreier Structural Steel Co., New York.
160 tons, hospital building, Cranston, R. I., to James H. Tower Iron Works, Providence, R. I.
155 tons, bridge, Shoshone River, Wyoming, to Wisconsin Bridge & Iron Co., Milwaukee.
152 tons, crossing at Rivera, Los Angeles county, California, to Virginia Bridge & Iron Co., Roanoke, Va.
150 tons, bridge, Lee county, Texas, to Austin Brothers, Dallas, Tex.
150 tons, state highway grade crossing elimination, Sheffield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.
140 tons, bridge, Sibley county, Minnesota, to Lakeside Bridge & Steel Co., Milwaukee.
140 tons, apartment, Jackson and Laguna street, San Francisco, to Bethlehem Steel Co., Bethlehem, Pa.
130 tons, building, Lime Materials Co., East Stroudsburg, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.
130 tons, building, E. I. du Pont de Nemours & Co., Carney's Point, Pa., to Morris Wheeler & Co., Philadedphia.
125 tons, state highway bridge, Caribou, Me., to American Bridge Co., Pittsburgh.
125 tons, state highway bridge, South Londonderry, Vt., to Vermont Structural Steel Corp., Burlington, Vt.
125 tons, boat storage shed, Bristol, R. I., to International Steel Co., Evansville, Ind.
120 tons, bridge, Benson county, North Dakota, to Illinois Steel Bridge Co., Jacksonville, Ill.
100 tons, foundry addition, Draper Corp., Hopedale, Mass., to Haarmann Steel Co., Holyoke, Mass.
100 tons, state bridge, Amherst, Mass., to New England Structural Co., Everett, Mass.
100 tons, state highway bridge, Lawrence, Mass., to Phoenix Bridge Co., Phoenixville, Pa.
100 tons, apartments, Flushing, N. Y., to Cypress Iron Works, New York.
100 tons, apartment, Long Island City, N. Y., to Cypress Iron Works, New York.
100 tons, state highway bridges, Fort Fairfield-Presque Isle, Me., to American Bridge Co., Pittsburgh.
100 tons, state highway bridge, Worcester, Vt., to Vermont Structural Steel Corp., Burlington, Vt.
100 tons, bridge, Jamaica Village, Vt., to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, Worcester Street Railway Co. garage, Worcester, Mass., to New England Structural Co., Everett, Mass.
100 tons, dormitory, University of Maine, Orono, Me., to Lyons Iron Works Inc., Manchester, N. H.
100 tons, taxpayer, Fifty-ninth street and Third avenue, New York, to Dreier Structural Steel Co., New York.
100 tons, school, Coney Island avenue, Brooklyn, N. Y., to Dreier Structural Steel Co., New York.

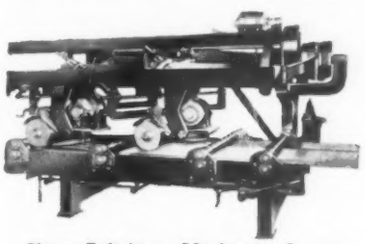
Shape Contracts Pending

12,000 tons, marine parkway superstructure; American Bridge Co. low at $2,139,000 on June 24 bid. Harris Structural Steel Co., New York, second low at $2,157,000.
11,000 tons, Marine Parkway lift bridge and approaches, Brooklyn, N. Y.; American Bridge Co., Pittsburgh, low bidder on superstructure, and Frederick Snare Corp., New York, low on substructure; 2200 tons sheet steel piling, 300 tons cast steel shoes, 100 tons structural shapes for railings, and

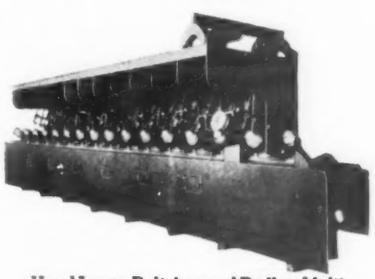
Automatic Machinery
POLISHING • BUFFING • GRINDING



Rotary Crankshaft Flash Grinder—A 6-wheel unit, grinds all flashes from eight automobile crankshafts per minute.



Sheet Polishing Machine—A continuous feed unit operating at various speeds depending on the finish desired.



Head Lamp Polisher and Buffer. Multiple head, conveyor type unit. Equipped with as many heads as required.

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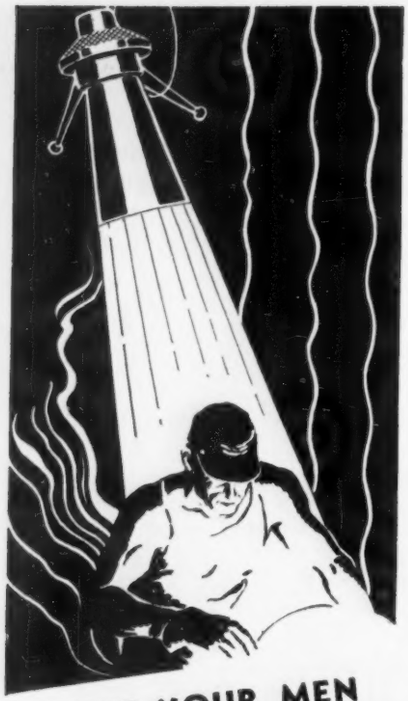

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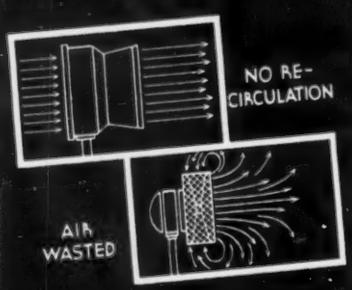

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500 tons machinery also required.
7150 tons, bridge, Cairo, Ill.; Mt. Vernon Bridge Co., Mt. Vernon, O., low.
7000 tons, superstructure, bridge across Ohio river at Cairo, Ill.; Mount Vernon Bridge Co., Mount Vernon, O., apparent low bidder.
5000 tons, west side elevated highway extension, Eighty-second to Ninety-fourth streets, New York; low bidder, Poirier & McLane Corp., New York.
3840 tons, including 1750 tons of piling, also 431 tons of forgings, castings and special analysis steel, dam No. 12, Bellevue, Iowa; bids to United States engineer, Rock Island, Ill., Aug. 4.
3700 tons, state bridges, Iowa; bids July 24.
3000 tons, lock No. 21, Quincy, Ill.; bids to Rock Island, Ill., engineers, July 28.
2900 tons, Rockland state hospital building, Orangeburg, N. Y.; low bidder, Starrett Bros. & Ekin Inc., New York.
2100 tons, lock No. 12, Mississippi river; bids to Rock Island, Ill., engineers, Aug. 4.
2000 tons, state bridges, Missouri.
2000 tons, state highway bridge, Springfield, Mass.; bids soon.
2000 tons, state highway bridge, Greenfield-Montague, Mass.; bids soon.
2000 tons, highway bridges for Missouri.
1500 tons, bridge across Baltimore & Ohio tracks, Washington.
1500 to 2000 tons, highway bridges for Kansas.
1300 tons, lock No. 4, Clarksburg, Mo., Central Engineering Co., Rock Island, Ill., low.
1200 tons, ice rink, East Thirty-seventh and Euclid avenue, Cleveland; bids opened June 29.
1200 tons, Hope street school, Providence, R. I.; general contract to John Bowen Construction Co., Boston.
1200 tons, state highway bridge, Rouses Point, N. Y.; Bethlehem Steel Co., Bethlehem, Pa., low.
1125 tons, bridge, Manhattan, Kans.
1100 tons, blast furnace rebuilding, Republic Steel Corp., Cleveland.
1000 tons, school, Whitesboro, Oneida county, New York; low bidder, Andrew Weston, New York.
1000 tons, column cores, warehouse, Terminal Warehouse Co., New York.
1000 tons, Clarkton, Mo., dam in Mississippi river; Central Engineering Co., Davenport, Iowa, low on general contract.
1000 tons, state highway bridge, Orford, N. H.; bids soon.
1000 tons, state highway bridge, Lowell, Mass.; bids soon.
1000 tons, state highway bridge, Chesterfield, N. H.; bids soon.
800 tons, building, Gordon Baking Co., Long Island City, N. Y.; plans revised.
750 tons, bridge, Columbus, O.
650 tons, open-hearth ladles, Inland Steel Co., Chicago.
600 tons, narcotic farm buildings, Ft. Worth, Tex.
600 tons, plant addition for Soundview Pulp Co., Everett, Wash.; plans out.
500 tons, power plant, Battle Creek, Mich.
500 tons, two hangars, Yerba Buena shoals, San Francisco; bids opened.
400 tons, enlarging St. Regis kraft pulp plant, Tacoma, Wash.; bids soon; H. S. Wright & Co., Seattle, general contractor.
310 tons, state bridge, Goodmans, N. J.; general contract to Weldon Contracting Co., Westfield, N. J.
300 tons, state bridge, Hightstown, N. J.; general contract to Kolyn Construction Co., Trenton, N. J.
300 tons, state highway bridge, Newburyport, Mass.
255 tons, school, Lancaster, Pa.; McNichol Contracting Co., Philadelphia, low on general contract; 300 tons of reinforcing bars also will be required.
250 tons, steel sheet piling, bank protection work near dam No. 5, Braeburn, Pa., on the Allegheny river; bids to be asked soon by Pittsburgh federal engineers.
250 tons, Old Harbor Village housing project, Boston; Matthew Cummings Co., Boston, low.
200 tons, Fleetwood housing project, Mt. Vernon, N. Y.
200 tons or more, 360-foot state span, Blackfoot river, Montana; Fred S. Birch & Sons, Great Falls, Mont., general contractor.
177 tons, state highway overpass, Andover, Conn.
150 tons, school, Wilkes-Barre, Pa.; bids asked.
150 tons, Joan of Arc school, Jackson Heights, N. Y.; low bidder, Chapman-Kruge Engineering Co., New York.
103 tons, pony truss bridge, Gerard township, Erie county, Pennsylvania; F. E. Trimpey, Rockwood, Pa., low on June 19 bids; Includes 24 tons bars.
100 tons, bridge, Lincoln county, Montana; bids July 8.
100 tons, building alterations, International Tailoring Co., New York.
100 tons, state highway bridge, Grafton, Vt.; bids opened on revised plans.
Tonnage unstated, sewage disposal, Rockland state hospital, Orangeburg, N. Y.; low bidder, F. H. McGraw Co., New York.
Unstated tonnage, for Allegheny county, Pennsylvania, department of works; bids July 2.

Reinforcing

Reinforcing Bar Prices, Page 71

New York—On June 23 leading mills instituted the practice of quoting published prices. The mill price to users is 2.05c base, Pittsburgh, for billet rolled bars, equivalent to 2.40c delivered, New York, which becomes 2.50c when the trucking charge to building site is added. Where the mills publish their prices they are unable to make any deviation without publishing a new price. It is believed, therefore, that the weakness which long has been reflected in the market will be less in evidence as long as the policy of published prices is in effect. Much activity is reflected in connection with a large number of projects slated to be closed without delay. Indications are that considerably

Concrete Awards Compared

	Tons
Week ended June 26	**4,345**
Week ended June 19	**1,556**
Week ended June 12	**3,195**
This week, 1935	**6,360**
Weekly average, 1935	**6,862**
Weekly average, 1936	**5,861**
Weekly average, May	**6,368**
Total to date, 1935	**125,414**
Total to date, 1936	**152,379**

more than 10,000 tons will be awarded prior to the end of July.

Pittsburgh — Pennsylvania state highway work continues to dominate the market and inquiries were issued for a letting to close July 10 at Harrisburg, Pa. Items included are 364,144 pounds of plain bars for Cumberland and Perry counties, 6176 pounds for Beaver county, and 15,360 pounds for Union county. Pittsburgh base price holds at 2.05c for carload lots of cut length new billet steel bars as quoted by distributors.

Cleveland—Mills running close to capacity. No definite deadline has been set on orders taken at current prices. Majority of tonnage is from small consumers, however inquiries comprising large tonnages are expected soon. Time allowed for delivery is almost twice as long as it was two or three weeks ago.

Chicago—Absence of large awards is offset partly by a substantial flow of small orders. Shipments against contracts continue heavy. Plans are out for the Bellevue, Iowa, dam, involving 525 tons of bars. Mills are pressed to give desired shipments.

Philadelphia—A substantial volume of small tonnage is being placed with sellers experiencing possibly the most active period this year. Among pending inquiries are 1500 tons for a vocational school here, on which bids have just gone in.

Detroit—Bids were taken June 27 on a $6,000,000 highway and bridge program for the state of Michigan, on which work will commence July 16. This letting, which is a record for highway work in one group in the state, involves 41 jobs in 29 counties and includes bids on 7 bridges.

Reinforcing Steel Awards

1250 tons, proposal 719, United States engineer office, Los Angeles, to Soule Steel Co., Los Angeles.

960 tons, Alemany boulevard sewer, San Francisco, to Soule Steel Co., San Francisco.

800 tons, bars, Upper Desplaines sewers, section 2, Chicago sanitary district, to Concrete Steel Co., New York, through S. A. Healy Co., Chicago.

375 tons, two buildings at United States military academy, West Point, N. Y., to Truscon Steel Co., Youngstown, O., through C. T. Wills Inc., New York.

210 tons, state bridge, Lycoming county, Pennsylvania, through Hempt Bros., Harrisburg, Pa., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, Indiana state bridge, to Concrete Steel Co., New York.

150 tons, Hales Corner housing project, Milwaukee, to Calumet Steel Co., Chicago.

100 tons, Wisconsin highway work, to Concrete Steel Co., New York.

100 tons, crossing at Sacramento, Calif., to Concrete Engineering Co., San Francisco.

100 tons, building, Monroe Calculating Machine Co., Newark, N. J., to Truscon Steel Co., Youngstown, O.

100 tons, two state spans, Chelan county, Washington, to Bethlehem Steel Co., Seattle.

Reinforcing Steel Pending

18,900 tons, proposal 741, United States engineer office, Los Angeles; bids opened.

5000 tons, Williamsburg, D. C., slum clearance project, superstructure; bids to be opened by PWA housing division, Washington, July 23.

2000 tons, warehouse, Eleventh avenue and Twenty-seventh street, New York.

1000 tons, Fleetwood housing project, Mt. Vernon, N. Y.

1000 tons, West Side elevated highway extension, Eighty-second to Ninety-fourth streets, New York; low bidder, Poirier & McLane Corp., New York.

750 tons, Marine Parkway lift bridge and approaches, Brooklyn, N. Y.; low bidder on substructure, Frederick Snare Corp., New York.

600 tons, New Jersey state highway, route 25, section 24; bids July 13.

525 tons, Mississippi river dam No. 12, Bellevue, Iowa; bids to United States engineer, Rock Island, Ill., Aug. 4.

500 tons, two hangars, Yerba Buena shoals, San Francisco; bids opened.

500 tons, Kings highway viaduct, St. Louis.

500 tons, Erie railroad grade crossing

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DEEP DRAWN SHELLS AND SHAPES

elimination, Port Jervis, N. Y.; low bidder, C. B. Moon, Cleveland.

500 tons, bridge over Baltimore & Ohio tracks, Washington.

400 tons, Old Harbor Village housing project, Boston; Matthew Cummings Co., Boston, low.

300 tons, school, Lancaster, Pa.; McNichol Contracting Co., Philadelphia, low on general contract; 255 tons of shapes also will be required.

250 tons, New Jersey state highway route 44, sections 2A, 4A and 7; bids July 13.

250 tons, dam in Mississippi River at Clarkton, Mo.; Central Engineering Co., Davenport, Iowa, low on general contract.

250 tons, Marine Parkway lift bridge and approaches, Brooklyn, N. Y.; low bidder on superstructure, American Bridge Co., Pittsburgh.

230 tons, Wabash railway grade separation, St. Louis.

200 tons, Stark county, Ohio, grade crossing elimination; bids June 27.

214 tons, two crossings at Albuquerque, N. Mex.; bids June 26.

182 tons, highway work, East Pennsboro township, Cumberland and Perry counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., July 10.

150 tons, state highway bridge, Rouses Point, N. Y.; Bethlehem Steel Co., Bethlehem, Pa., low.

150 tons, sewage disposal plant, Rockland state hospital, Orangeburg, N. Y.; low bidder, F. H. McGraw Co., New York.

142 tons, state grade crossing elimination, Hightstown, N. J., general contract to Kolyn Construction Co., Trenton, N. J.

100 tons, contract B, metropolitan district water supply commission, Boston; bids July 2.

100 tons, warehouse, Armour & Co., Boston.

100 tons, American Railway Express Co. garage, Boston; Hegeman-Harris Co., Boston, general contractor.

100 tons or more, three state spans in Idaho; general contract to J. M. Sharp, Boise, Idaho.

100 tons, Rockland state hospital building, Orangeburg, N. Y.; low bidder, Starrett Bros. & Ekin Inc., New York.

100 tons, state grade crossing elimination, Goodmans, N. J.; general contract to Weldon Contracting Co., Westfield, N. J.

100 tons, bridge, Essex county park commission, Newark, N. J.; low bidder, John Dorer, Irvington, N. J.

Tonnage unstated, Pennsylvania railroad, North Elizabeth, N. J.

Unstated tonnage, state highway department office and shops, Helena, Mont.; Fred B. Dudley, Great Falls, Mont., general contractor.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Absence of any important pig iron inquiry continues, in view of the policy of most melters in purchasing spot carload requirements. Consequently, stock piles of most foundries carry little more than three to four weeks' requirements. This moderate condition in inventories forecasts a fairly steady rate of shipments next month. Prices are firm.

Cleveland—Auto and farm equipment foundries show a slight falling off during the past week. This condition is offset, to a certain extent, by the stimulated consumption for railroad castings and machine tool builders. Strong third quarter buying is looked for. Price condition is firm and no increase has been announced for the third quarter.

Reduction of the maximum surcharge on pig iron freight charges from two cents per hundred pounds, or 44.8 cents per gross ton, to 25 cents per gross ton, has little effect on shipments from this center, although iron from Erie, Pa., and Buffalo to New England will bear the lower surcharge.

Chicago—June pig iron shipments will show only a small change from those of May, while indications point to a fairly steady movement in July. While August might be expected to mark the low point in deliveries, automotive requirements are expected to start upward around that time. Producers have fairly heavy backlogs, indicating a fair rate of foundry operations during the approaching quarter. Prices are steady. Federal furnaces of Interlake Iron Corp. will light a stack here July 1.

Boston—A number of additional third quarter contracts feature the market here. Buying is not in keeping with the current improved rate of melt, however, due to the large stocks which some consumers continue to carry over from last fall.

New York—The reported placing of 4000 tons of foundry and malleable by an eastern buyer for delivery at several plants leads third quarter pig iron buying in this district. Buying for the most part is for nearby needs. No price changes are anticipated.

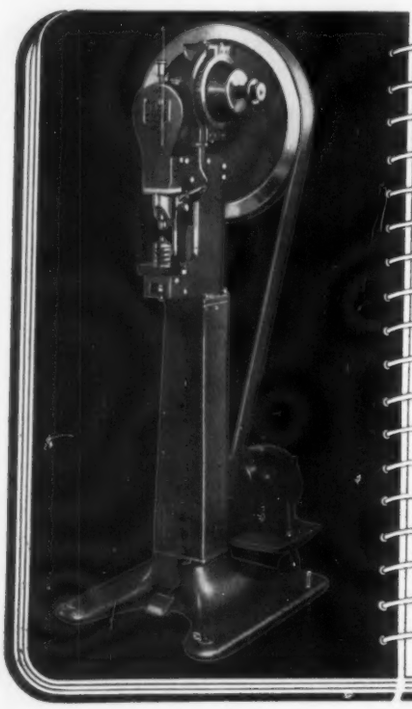
Philadelphia—Pig iron specifications are more lively, although buying continues largely hand-to-mouth. While some modifications in freight surcharges become effective July 1, they will have no bearing on delivered prices in this district.

Buffalo—Pig iron production continues high, with 10 blast furnaces in operation. Producers are having difficulty in building reserves of iron and are being pressed for deliveries on some special grades.

Cincinnati—Shipments of pig iron during June have been the best in second quarter, but specifications are beginning to reflect considerable shrinking in melt, attributed largely to seasonal dullness in automobile and stove manufacture. Little contracting for third quarter needs hints at a continuance of recent buying practice.

St. Louis—It is estimated that about 75 per cent of the melters of pig iron have covered third quarter requirements. The remainder are content to buy in spot lots. Sales continue active and shipments are well maintained. June will show a gain over May.

Birmingham, Ala.—Eleven blast furnaces are in operation, with a second furnace scheduled to go down this week. Production for first half will approximate total output for 1935, and will exceed that for 1932 and 1933. Surplus stocks are large.



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Scrap

Scrap Prices, Page 73

Pittsburgh—The first trace of improved sentiment in the last six weeks seems to be gaining ground in the local market, although last week at least one district mill was able to buy a moderate-sized tonnage of No. 1 heavy melting steel at $13.50, delivered, which represents no change from previous transactions. The market's improved tone still is confined, therefore, to brokers' buying prices, which range steadier at around $13 to $13.25, and even $13.50, this district, against shortages. This week the market is faced with usual monthly railroad lists, led by the Pennsylvania accumulation, June 30, which includes 10,450 tons of No. 1 heavy melting steel, 2910 tons of scrap rails, and an unusually large item of 2200 tons of malleable.

Cleveland—Scrap yards have been practically clear of accumulations and dealers are slow to make further commitments. Considerable scrap is still due on contracts and some new tonnage was sold a fortnight ago. Prices are nominally steady. In the Valleys some declines have been registered, 25 to 50 cents under previous levels.

Chicago—The market tone is slightly stronger, as indicated by bids of $13.75 and higher for heavy melting steel on recent railroad lists. The top of the consumers' market for this grade nominally continues $13 on the basis of last sales, but subsequent buying is expected to develop higher levels. While a fairly heavy tonnage still is due against contracts, steelworks are expected to enter the market soon for additional tonnages. Railroad specialties are higher under the influence of better demand from steel foundries.

Boston—Demand for iron and steel scrap from domestic consumers continues slow. Fair tonnages are being bought for export, however, serving to prevent noticeable weakening.

New York—Prices on scrap for export have been raised 50 cents a ton. Brokers now are paying $10 on New York and Brooklyn docks for No. 1 heavy melting steel and $9 for No. 2. Buying for export continues the chief activity here. Brokers and dealers have comparatively little domestic tonnage on contract and little new business is coming from domestic users.

Philadelphia—While there is little new tonnage to test the market, scrap prices appear to be scraping bottom. Following the purchase of a round tonnage at $7.50, delivered consuming plant, recently, machine shop turnings are unchanged and no variation is noted in the principal grades of melting steel and cast scrap. Stabilizing factors are prospects for good steelmaking output and slightly better interest from abroad, particularly Japan.

Buffalo—Small lots of No. 1 heavy melting steel are reported to have been sold for local delivery at $12, delivered. It is believed, however, the sellers have no intention of delivering more than a small part of the tonnage in No. 1 grade and that it will be No. 2 steel and other differential grades that actually will be delivered. The market is nominal pending completion of delivery on large unfilled orders.

Detroit—The steel scrap market here maintains a quiet tone with consumers' prices locally unchanged through the past week. July automotive lists reflect only a slight decline in size from those of a month ago.

Cincinnati—Activity in iron and steel scrap is at a low point for the year, brokers being covered on contracts and no buying by mills. Consumer offers fail to attract material.

St. Louis—Purchase of melting steel and specialties by a mill on the East Side, plus short covering by dealers had the effect of boosting prices of a number of items and generally adding strength. There are no railroad lists before the market and there is a marked scarcity of offerings from the country dealers.

Toronto, Ont.—Trading in iron and steel scrap is in good volume but demand is specialized. Local dealers state that there is a steady market for heavy melting steel for delivery to mills in the Hamilton district, and minor shipments of turnings are going forward. In the Montreal area, in addition to heavy melting steel there is a fair market demand for steel axles and rails, but the latter is somewhat scarce.

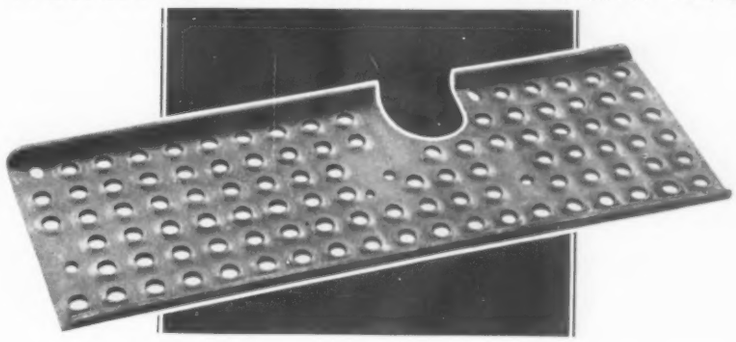
Warehouse

Warehouse Prices, Page 74

Pittsburgh—Effective July 1, jobbers have announced $2 a ton increases in bars, plates, shapes, sheets, hoops and bands, a $3 increase in cold-finished bars, and a 5 per cent increase in track bolts. Black and galvanized wire, as well as nails, will remain unchanged. Demand continues heavy.

Cleveland — Sales on finished

RAILROAD SAFETY via STAMPINGS



RAILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

Parish cites this example as but one of many improvements that have been brought about through an engineering service that likewise belongs to you . . . May we serve?

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products are well above May so far this month. It is felt that the present strong demand will continue on through third quarter.

New York—Iron and steel jobbers are considering what action they will take on prices when mill prices on shapes, plates, bars, sheets and other products are advanced $2 a ton July 1.

Boston—Demand for finished rolled steel products continues steady, and June sales are well ahead of those for May. Advances are expected when the mill prices on certain finished products are increased July 1.

Chicago—Higher prices to meet mill advances will become effective July 1 and in most cases will parallel the upturns adopted by producers. Business remains fairly steady and June sales compare favorably with those of May.

Philadelphia—Local distributors have notified customers of the impending mill advance and have indicated warehouse prices will reflect this increase July 1.

Detroit—Hot-rolled steel items are being advanced $2 a ton for effect July 1. This affects bars, plates, shapes, sheets, hoops and bands. No change has occurred in nails or wire, but cold-finished steel bars are to be advanced $3 a ton.

St. Louis—Farmers in this district have been too busy with crops to do repair work, with the result that demand for roofing and wire products has fallen off. However, bale ties are more active.

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SAMUEL EARLEY, *Managing Director*

Philadelphia

Ferroalloys

Ferroalloy Prices, Page 72

New York—Ferromanganese shipments this month will be the heaviest so far this year, according to some sellers. This reflects high steelmaking operations, and with these latter operations expected to continue at a good rate throughout July, a further brisk movement of ferromanganese is anticipated. Prices are unchanged at $75, duty paid, Atlantic and Gulf ports. Impending revisions in freight surcharges July 1, will not affect ferromanganese or any of the ferroalloys. Domestic spiegeleisen, 19 to 21 per cent, is also steady, holding at $26, Palmerton, Pa., on lots up to 50 tons and $24 on 50 tons and over.

Ferrosilicon briquets have been reduced $3 per ton to $74 per gross ton in carloads on contracts. Spot carload price now is $79 and ton lots $84. Less than ton lots are unchanged at 4 cents per pound. These prices are f.o.b. Niagara Falls, N. Y., freight allowed.

Metallurgical Coke

Coke Prices, Page 71

Beehive coke producers in the Connellsville, Pa., region are hopeful of a marked increase in business soon. They point out that most by-product ovens in the country which are readily available are being pressed for coke supplies for blast furnace operations and that inquiry is again being diverted to the Connellsville region for high grade metallurgical coke. Recently two large tonnages have been placed by buyers whose by-product coke capacity is fully engaged. This has already resulted in a moderate scarcity in foundry coke, which is quoted firmly at $4.25 to $4.35, f.o.b. beehive ovens, Connellsville, Pa., and in premium foundry coke at $5.35 to $5.50 on the same basis. Standard furnace coke, beehive grade, is quoted $3.50 to $3.65, with the maximum being done on more transactions.

Steel in Europe

Foreign Steel Prices, Page 74

London—(*By Radio*) — Demand for all classes of steel and iron in Great Britain continues strong in all districts and production is barely adequate to meet requirements. Deliveries have been extended and prices are firm. Most works are operating full time and capacity. William Bearmore & Co. Ltd., Glasgow, has completed renovating and enlarging its plant and has increased annual steel capacity 50,000 tons.

Exports of sheets and galvanized sheets are dull but shipments abroad of tin plates are improving.

The Continent reports steelworks in France are resuming work. The strike at Antwerp, Belgium, has been ended, releasing export material that had been held up, but production still is curtailed somewhat. Berlin reports export trade is satisfactory.

Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 71

Third quarter contracting is slow, but specifications continue relatively heavy and June appears likely to produce the best business for any month this year. Higher prices on bolts, nuts and rivets constitute a minor factor in stimulating specifications. Some bolt and nut business has been placed at the new prices, 5 points higher than those prevailing before June 6. Machine bolts are quoted at 70 and 10 off for ½-inch and smaller and 70 and 5 off for larger and longer.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Tin plate producers are now running three to four weeks in arrears on shipment of hot-rolled plate and about seven weeks' delivery is the earliest cold reducing mills can promise. As no decline in can-makers' specifications has appeared a continuation of the present brisk rate of activity is forecast through the usually dull summer period.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—The tin market was demoralized, this week by the announcement that export quotas for the third quarter have been raised 5 points to 90 per cent of standard tonnages. Other major nonferrous metals held unchanged.

Copper—Buying continued light as expected and all first hands quoted firm levels on the basis of 9.50c, Connecticut, for electrolytic. Export copper was slightly firmer.

Lead—More active demand is expected over the next few weeks which tended to support present levels in a quiet market at 4.45c, East St. Louis, and 4.60c, New York.

Zinc—Prime western prices were well sustained last week at the lower levels established at the end of the previous week. Fair business was booked on the basis of 4.85c, East St. Louis.

Tin—Prices broke sharply to around 40.37½c on Straits spot following the advance in quotas on Thursday. From present indications it appears that the new quota rate is more than needed to meet world consumption needs.

Antimony—Demand was dull with prices unchanged at 13.00c, duty paid New York for Chinese spot and 11.50c, New York, for American spot.

Equipment

Chicago—Wisconsin Steel Works, South Chicago, subsidiary of International Harvester Co., has contracted with the United Engineering & Foundry Co. for a blooming mill and a billet mill, part of the modernization program being carried on by the former. Construction of the new $5,500,000 tin plate cold rolling plant at the Gary works of American Sheet & Tin Plate division has been authorized by Carnegie-Illinois Steel Corp. This work is a part of the $40,000,000 program authorized for this company some time ago. Work continues on installation of new open hearths and blooming mill for Inland Steel Co. An inquiry currently is pending for open hearth ladles to be used with this addition. Machinery markets remain fairly active, with machine tool sales and inquiries holding around their previous rate. Foundry equipment demand holds near the year's peak.

Seattle—All items in machinery and equipment stocks continue in good demand, Alaska buying heavily for seasonal requirements while public projects are calling for highway machinery. Mining and logging are active.

Construction and Enterprise

Ohio

CLEVELAND—City, division of light and power, Room 105, City hall, will accept bids received until noon, July 3, for replacing soot blowers and piping on boilers at the East Fifty-third street plant.

CLEVELAND—Addressograph-Multigraph Corp., 1410 Chardon road, has leased 40,000 square feet of space near the present plant for future expansion purposes.

CLEVELAND—Clark Controller Co., 1146 East 152nd street, plans to build a heating plant, and an addition to the assembly and stock room. Cost is $35,000. W. H. Williams is vice president.

DAYTON, O.—Inland Mfg. Co., division of General Motors Corp., Detroit, has announced a $1,000,000 expansion program here, $750,000 to be spent on a 175,000 square foot addition; $150,000 to increase steam capacity; and $150,000 for the purchase of machinery. (Noted STEEL June 22).

DELPHOS, O.—City, A. E. Weger service director and Carl Simon, Van Wert, O., consulting engineer, are preparing plans that will mature in August for the construction of a municipal light plant.

IRONTON, O.—Marting Iron & Steel Co.'s Big Etna furnace property in East Ironton on Vine street was damaged by fire June 17. Damage centered in the blacksmith, electrical and carpenter shops.

LIMA, O. — Ohio Power Co., Newark, O., expects to extend and improve transmission and distributing lines here, and also to construct a new substation. Total cost to be $300,000.

LORAIN, O.—Steel Stamping Co., 3553 Broadway, plans to construct an addition to its plant to manufacture pressed metal toys. Joseph Gould is president.

NEWTON FALLS, O.—City council is awaiting report of Bryant & Sigmon Engineering Co. on the advisability of spending $160,000 on a municipal electric light and power plant.

SMITHFIELD, O.—Village board of public affairs, L. A. Taylor, clerk, asks bids until July 8 for furnishing one 65 gallon per minute turbine pump, and one 35 gallon per minute turbine pump, contract 2; steel water towers with capacities of 100,000 and 75,000 gallons, each, contract 8; and to furnish valves, valve boxes and hydrants, contract 9, in a waterworks program estimated to cost $60,000. Harrop & Hopkins, 541 Wood street, Pittsburgh, is consulting engineer.

TIFFIN, O.—City has under consideration plans prepared by Harvey P. Jones Co., Second National Bank building, Toledo, O., for a sewage disposal system to be financed from $500,000 for new sewers and a disposal system.

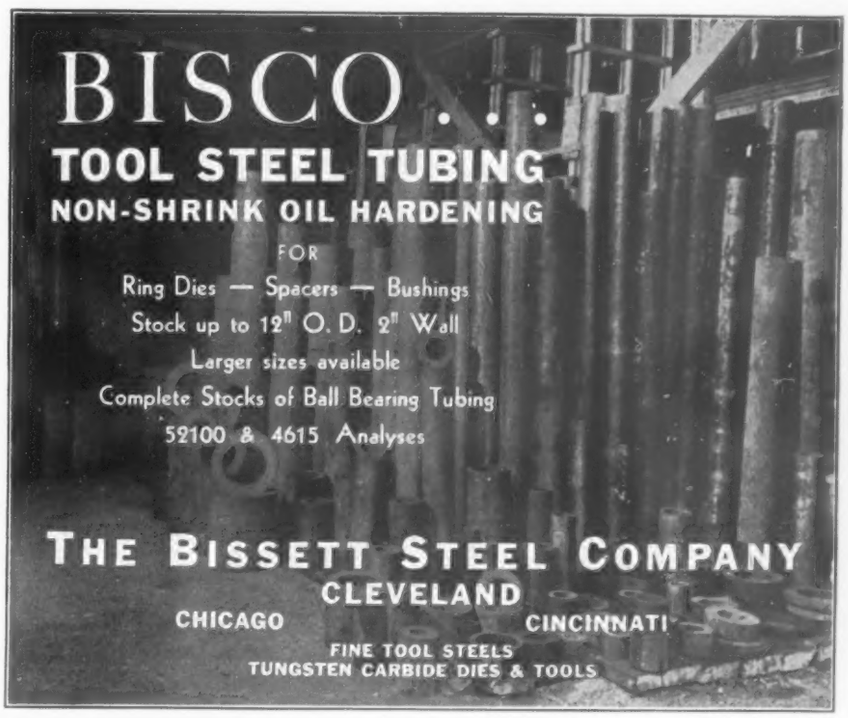
TOLEDO, O.—Standard Oil Co. of Ohio, Midland Bank building, Cleveland, will spend approximately $1,500,000 on a combination cracking and distilling unit here. Contract will be let soon, and 10 to 12 months will be required to complete work.

TOLEDO, O.—S. M. Jones Co., oil well supply manufacturer, has awarded contracts for new buildings, and equipment to cost $150,000. Percy C. Jones is president.

Pennsylvania

ETNA, PA.—Metzer Bolt & Nut Co. proposes to reconstruct the plant recently damaged by fire. Cost is estimated at $40,000.

MEADVILLE, PA. — Pennsylvania Meadville Distilling Co. proposes to spend $300,000 on a bottling and recasing building and a warehouse. Plans ready in about three months. F. F. Bol-



linger, Duss avenue, Ambridge, Pa., is engineer.

MEADVILLE, PA.—Raybould Coupling Co. has been granted a state charter. C. K. Strausbaugh, E. W. McGill and W. L. Gilmore are incorporators of this $130,000 concern.

NEW CASTLE, PA.—City school district will receive bids until July 15 at office of the board, 116 East street, for furnishing new hot air furnaces and an air washer humidifier in the Pollock school; and alternate bids will be taken for installing a steam heating plant. John B. Bechtol is secretary.

PHILADELPHIA — Frankford arsenal is in the market until July 28 for six spindle drill presses, inventory 314-36-562.

PITTSBURGH — Pittsburgh Porous Drain Pipe Co. expects to reopen soon the plant leased from Cyclops Foundry Co., Monongahela, Pa. Harry V. Bovard, Mt. Lebanon, Pa., is in charge of remodeling, and John F. Edmonds, district manager of Anchor Packing Co., Crafts building, here, will head the pipe company.

PITTSBURGH — O'Hara township school district will receive bids until July 3 for new heating and ventilating equipment for Montrose and Kerr schools. James T. Steen is architect. Russell Poppleton is secretary of the district.

Michigan

DETROIT—Climax Molybdenum Co., Woodrow Wilson avenue, estimates a 60 x 200 foot factory will cost $40,000. C. W. Dichey, 2225 David Stott building, is architect.

DETROIT—Knight Screw Products Co., 6510 Epworth street, proposes to purchase land adjoining its factory for expansion purposes.

DETROIT—Delray Mfg. Co. has been incorporated to manufacture automotive parts by Elmer F. Waterbor, 7818 West Jefferson avenue.

DETROIT—Boyd-Cooper Heating Co. has been incorporated to manufacture heating equipment by Elmer L. Boyd, 16196 Kentucky avenue, New York.

DETROIT—Redford Tool & Die Co. has been incorporated to manufacture machine tools by Forrest B. Wright, 2497 Tyler avenue.

DETROIT—Detroit Tool & Mfg. Co., 656 Smith, expects to double its factory space with a new addition.

FLINT, MICH.—Buick Motor Co., Harlow H. Curtice president and general manager, will spend $1,500,000 on new buildings, including a new transmission plant and a new heat treating department for the gear and axle plant, that will add 400,000 square feet of floor space to the company's facilities. (Noted STEEL June 15).

JACKSON, MICH.—Consumers Power Co. may spend $60,000 for additions to the power house at Battle Creek, Mich., on plans now being prepared.

MUSKEGON, MICH.—National Piston Ring Co. has been incorporated to manufacture metals by George W. Olson, Hackley Union National Bank building.

PONTIAC, MICH.—American Forging & Socket Co. plans to construct a factory building.

Connecticut

GREENWICH, CONN. — Electrolux Inc., maker of vacuum cleaners, plans to purchase conveyors and other equipment for installation in a new 3-story factory building in Old Greenwich. Total cost is nearly $100,000.

Massachusetts

SPRINGFIELD, MASS. — Westinghouse Electric & Mfg. Co., 647 Page boulevard, expects to let contract soon for construction of a 2-story, 40 x 325 feet, concrete and steel building at a cost of more than $37,000. J. W. Huston is purchasing agent.

New York

GOUVERNEUR, N. Y.—Board of education plans to advertise for bids in autumn for metalworking and other equipment for the manual training department of the Dean high school.

HAMBURG, N. Y.—S. B. Abbott is in the market for a motor driven, 6-inch jointer and rip saw.

NEW YORK—Signal corps, procurement district, Fifty-Eighth street and First avenue, asks bids until July 10 for power units, circular NY—37-1.

NEW YORK — Mohawk Machine & Tool Co., 161 Grand avenue, has leased additional space.

ROCHESTER, N. Y.—J. F. Spinning, superintendent of city schools, expects to purchase new machinery for elementary machine shop and to increase other facilities at the Industrial and Edison technical high schools.

SYRACUSE, N. Y.—Continental Can Co., Pershing Square building, New York, plans to spend $40,000 on a factory addition at the Water street plant.

New Jersey

NEWARK, N. J.—Gee Dee Mfg. Co., has been incorporated to manufacture electrical machinery. Milton Guttman is agent.

Illinois

CHICAGO—Chicago Screw Machine Co., 1026 South Homan avenue, has engaged J. B. Fischer, 7322 South Lafayette street, to draw plans for a $50,000 addition.

CHICAGO — National Park-O-Graph Corp. has been capitalized at $1,000,000 to manufacture and distribute parking meters. David C. Rockola, 625 West Jackson boulevard, is president.

Alabama

ALEXANDER CITY, ALA.—R. L. Kenan & associates, consulting engineer and architect, Bell building, Montgomery, Ala., soon will take bids for a Butane gas plant and distribution system here; and until July 9 for a Butane plant at Union Springs, Ala.

BIRMINGHAM, ALA.—W. M. Smith & Co., dealer, First avenue, North, is in the market for a 25-ton locomotive crane.

SUGGSVILLE, ALA.—Rural Electrification Authority, Gordon Persons, chairman, Montgomery, Ala., will take bids soon for constructing lines to serve Suggsville, Allen, Slipta and Coffeeville.

Indiana

ANDERSON, IND. — Delco-Remy Corp., 2401 Columbus avenue, will purchase materials for a 1-story, 200 x 200 feet, concrete and steel addition, and equipment. F. C. Kroeger is general manager.

ANDERSON, IND.—Guide Lamp Co., division of General Motors Corp., Detroit, plans to spend $250,000 for improvements, including purchase of motors and conveyors, and the construction of a 280 x 200 feet plant.

EVANSVILLE, IND.—Servel Inc., Martin avenue, will spend $27,000 for an addition to the sheet metal department of the plant, where electric and gas refrigerators are manufactured. W. F. Thatcher is president.

FORT WAYNE, IND.—No-Lid Metal Products Corp., 305 Old First Bank building, has been formed to manufacture cans and other containers. J. E. P. Dillon, Virgil Metz and W. J. Mondhank are the incorporators.

LOGANSPORT, IND. — Logansport Machine Co., 527 East Market street, has appropriated $100,000 for expansion, including $50,000 for a new building. F. B. Wilkinson is president.

Maryland

PERRYVILLE, MD.—Cooper Machine & Mfg. Co. has been incorporated by Helen M. Cooper, here; and E. D. E. Rollins, Elkton, Md.

District of Columbia

WASHINGTON — Navy department, bureau of supplies and accounts, asks bids until July 3 for miscellaneous water tube boilers and parts, schedule 8184; and until July 7 for miscellaneous gears and pinions delivered at Washington, schedule 8197.

WASHINGTON—Architect for the capitol accepts bids until July 10 for a belt conveyor for use in the library of congress.

Kentucky

INEZ, KY.—Inez Power Co. has been incorporated by R. L. Hale and W. B. Richmond.

Florida

FORT PIERCE, FLA.—City bonds totaling $149,000 have been validated for the construction of an addition to the municipal light plant. A PWA project.

LAKELAND, FLA.—City may receive a PWA grant through James E. Cotton, acting state director, for light and water extensions estimated to cost $26,600.

Georgia

ATLANTA, GA.—Atlantic Engineering Co., dealer, 185 Seventeenth street, Northeast, is in the market for four 7 x 9 and four 9 x 10 double cylinder, double drum, steam hoisting engines with boilers; and drag scraper buckets with capacity of 1½ to 3 cubic yards.

MOULTRIE, GA.—Leo T. Barber, contractor, is in the market for a 2-phase, 1½-horsepower electric motor.

Mississippi

VICKSBURG, MISS.—United States engineer, P. O. box 667, accepts bids until July 7 for two screw conveyors, circular 322.

Tennessee

HENDERSON, TENN. — City has voted to issue $35,000 worth of bonds to finance construction of electric power distribution lines.

West Virginia

BLUEFIELD, W. VA.—W. A. Light,

(*Please turn to Page* 90)

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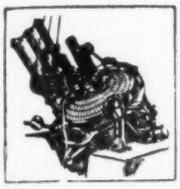

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(*Concluded from Page* 88)

chairman of city sanitary board, accepts bids until July 3 for furnishing and installing two 2100 gallons per minute, and one 1400 gallons per minute, motor driven, centrifugal pumping units, with all appurtenances, including motors. Morris Knowles Inc., 507 Westinghouse building, Pittsburgh, engineer, has contract No. 4.

CHARLESTON, W. VA.—Standard Oil Co. plans to spend $10,000 for construction of a storage tank with a capacity of 625,000 gallons of gasoline at Standard street and McCorkle avenue.

Virginia

LEXINGTON, VA.—Town council is awaiting report of engineer engaged to determine feasibility and advisability of constructing a municipal light and power plant.

WYTHEVILLE, VA.—R. P. Johnson, dealer, is in the market for a 30-horsepower locomotive boiler and engine remounted on sills.

Missouri

FLAT RIVER, MO.—Houghs Machine shop is in the market for a 40 volt, 350-400 ampere generator for electric welding unit.

ST. LOUIS—Owens-Illinois Can Co., new subsidiary of Owens-Illinois Glass Co., 965 Wall street, Toledo, O., will operate the recently-acquired St. Louis Can Co. for the manufacture of metal containers.

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, is in the market for a used, 400-500-600 ton capacity hydraulic wheel press with 84 inches between bars; a 3-phase, 60-cycle, 240 pounds steam pressure, 100 degrees superheat, 10 pounds back pressure, 500 kilovolt-ampere turbogenerator, and a 440 or 2300 volt natural gas engine generating plant in 2, 3 or 4 units.

WELLSTON, MO.—St. Louis Spring Co., 3135 Washington avenue, has taken over the plant of the old St. Louis Frog & Switch Co., 6650 Easton avenue.

Oklahoma

BARTLESVILLE, OKLA. — Phillips Petroleum Co. expects to spend $200,000 for a casinghead gasoline plant at Twenty-eighth and Prospect streets, Oklahoma City, Okla. A. H. Rinery, Bartlesville, engineer, has prepared the plans.

BETHANY, OKLA. — Earl W. Baker Utilities Co. plans to construct an additional 51 miles of rural lines at a cost of $40,000.

OKLAHOMA CITY, OKLA. — Mid Continent Petroleum Corp., 1128 West Main street, expects to spend $100,000 for construction of a gasoline refinery near Holdenville, Okla.

Texas

FLOYDADA, TEX.—City has voted to issue $120,000 worth of bonds to finance construction of an electric light plant.

GAINESVILLE, TEX. — Chamber of commerce is negotiating for the construction of a new oil refinery here.

GALENA PARK, TEX.—City has voted to issue $60,000 worth of bonds for a waterworks, and plans to purchase a 500 gallon per minute pump with motor. Garrett Engineering Co., P. O. box 1726, Houston, Tex., is consulting.

HOUSTON, TEX.—Fort Bend Utilities Co., I. H. Kempner, 1502 J street, Galveston, Tex., is accepting bids for constructing and equipping a $250,000 plant to generate power and light for the Sugarland Industries. Valco Co. Inc., M. & M. building, Houston, is engineer; and Arthur Nelson, 31 St. James avenue, Boston, is consulting engineer.

MINGUES, TEX.—City will take bids about July 10 for constructing a $52,000 waterworks distributing system. Hawley, Freese & Nichols, Capps building, Forth Worth, Tex., is engineer. (Noted STEEL May 15).

PECOS, TEX.—City may vote on issuing $20,000 worth of bonds to finance construction of a waterworks. Lawson Goodrich is prominent in the project.

Wisconsin

COLUMBUS, WIS.—Columbus Rural Electric Cooperative association has secured $260,000 federal aid and plans to erect transmission and distribution lines.

MILWAUKEE—Union Refrigerator Transit Co. has purchased from Benesch Iron & Steel Co. a 6-acre site adjoining the Union firm's plant. Cyrus L. Philipp is vice president.

PORT WASHINGTON, WIS.—J. E. Gilson Co., maker of gray iron castings, is starting another $20,000 addition. John E. Gilson is president and general manager.

SOUTH MILWAUKEE, WIS.—Line Material Co., South Milwaukee, is awarding contracts for a new transformer shop, which together with equipment will cost approximately $100,000. W. D. Kyle is president.

Kansas

KANSAS CITY, KANS.—Board of public utilities, Charles A. Lowder, secretary, City hall, asks bids until July 1 for a 6000-horsepower high pressure boiler with accessories, contract 1. Part of power plant improvements. (Noted STEEL June 22).

TOPEKA, KANS.—State highway commission, Ira E. Taylor engineer in charge of maintenance, Masonic Temple, asks bids until July 3 for heavy crawler type tractors for Salina, Garrett, and Topeka.

Iowa

BOONE, IOWA—Iowa Electric Light & Power Co., Cedar Rapids, Iowa, expects to spend $100,000 for extensions and improvement in the local power plant and distribution lines.

CORNING, IOWA — Adams County Cooperative Electric Co. plans to erect 110 miles of distribution lines.

IOWA CITY, IOWA—City plans for construction of a $915,000 distribution system for the municipal electric power and light plant are expected to mature soon. Burns & McDonnell Engineering Co., 117 West Linwood boulevard, Kansas City, Mo., is consulting.

Nebraska

BLAIR, NEBR.—Nebraska Power Co., Seventeenth and Harney streets, Omaha, Nebr., has secured permission to extend transmission lines in vicinity of Blair, and in the Cedar Bluffs, Nebr., district.

OMAHA, NEBR.—United States engineers office, 819 City National Bank building, Capt. Herbert B. Loper, district engineer, asks bids until July 6, for furnishing and delivering free on board at contractor's plant one full diesel engine, marine type, of not less than 125 British horsepower, on form 643-36-603.

OMAHA, NEBR.—Gate City Iron Works, F. J. Daugherty, president, has purchased 165,000 square feet of ground adjoining the present factory at Eleventh and Seward streets, and plans to expand. (Noted STEEL May 4).

OMAHA, NEBR.—Armour & Co., Thirtieth street, plans to purchase conveyors and other equipment for installation in a $1,000,000 factory to be erected that will contain 2,700,000 cubic feet.

Montana

HUNTLEY, MONT.—Huntley Project Development association expects to erect 110 miles of electric distribution lines, a power substation, and other equipment, in Yellowstone and Big Horn counties. Association has applied to federal government for $130,000.

California

BURBANK, CALIF.—H. I. Stites, city engineer, has been authorized by council to purchase a trenching machine with capacity to cut to a depth of 10 feet.

LOS ANGELES — Department of water and power, D. P. Nicklin, purchasing agent, asks bids on specification X-32 for various size gate valves until 2 p. m., July 6.

LONG BEACH, CALIF.—Pacific Oil & Meal Co. has applied for a permit to build two structures at 1647 West Seventh street, at a cost of $38,000. Jacob Boysen, 3031 Potomac avenue, Los Angeles, is engineer.

LOS ANGELES—Twentieth Century-Fox Corp. will spend $50,000 for a power house and two ventilating apparatus rooms in a $4,000,000 structural program in Westwood Hills, Orton avenue, West Los Angeles.

LOS ANGELES—Hepburn & McTavish Ltd. Inc., a distilling firm at 432 Colyton street, is beginning construction of 14 buildings, including a power house. R. R. Ranspot is executive vice president, and Arlos Sedgley is the architect supervising construction.

LOS ANGELES—Metropolitan water district has advanced bid date until July 3 for furnishing two 75-ton traveling cranes; two 60-ton traveling cranes; and one 40-ton traveling crane. Specification 156, free on board cars at bidder's shipping point.

OAKLAND, CALIF.—Pacific Tank & Pipe Co., Tidewater and High streets, suffered the loss of the power plant, and the factory was damaged by fire on June 11.

SACRAMENTO, CALIF. — City is seeking $5,400,000 from the federal government to help finance a proposed $12,000,000 expansion and improvement of electric distribution lines, power substations and the like.

Washington

EVERETT, WASH.—Soundview Pulp Co. has been authorized to spend $2,100,000 for improvements, and the municipal government has been authorized to issue $1,300,000 worth of bonds to finance extensions to the water supply system for the pulp company.

SHELTON, WASH.—Rainier Pulp & Paper Co., through D. B. Davies, has announced plans for the expenditure of $500,000 for a plant addition that includes a complete breakdown mill.

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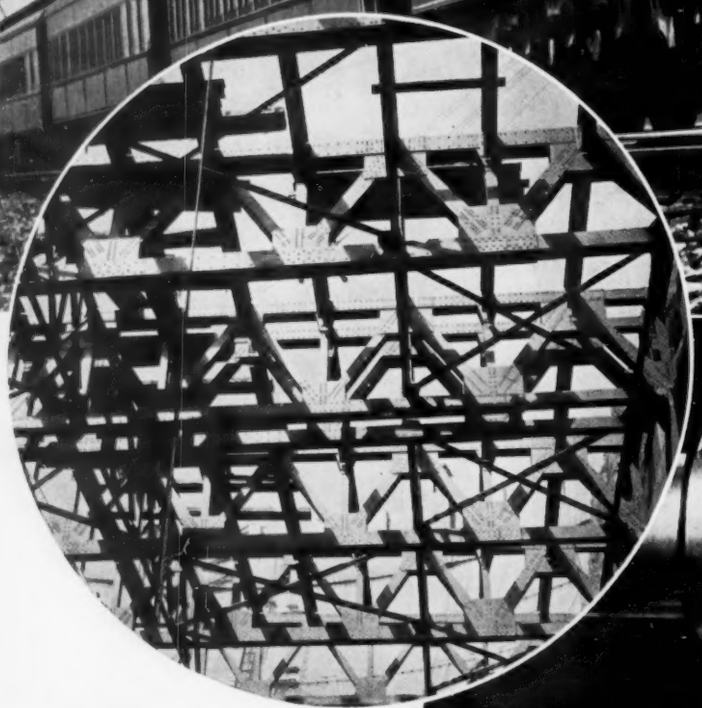
More POWER

Steel for railroad electrification built by American Bridge Company. Steel rolled by Carnegie-Illinois Steel Corporation. Rail bonds, electrical wires, cables and strand made by American Steel & Wire Company also play a big part in railroad electrification.



(Above) *Boulder Dam Power House roofs were fabricated by American Bridge Company, especially heavy to withstand rock slides. Structural steel was rolled by Carnegie-Illinois Steel Corporation.*

(Right) *These huge pinions were forged and machined by Carnegie-Illinois Steel Corporation for an outstanding electrical equipment manufacturer.*

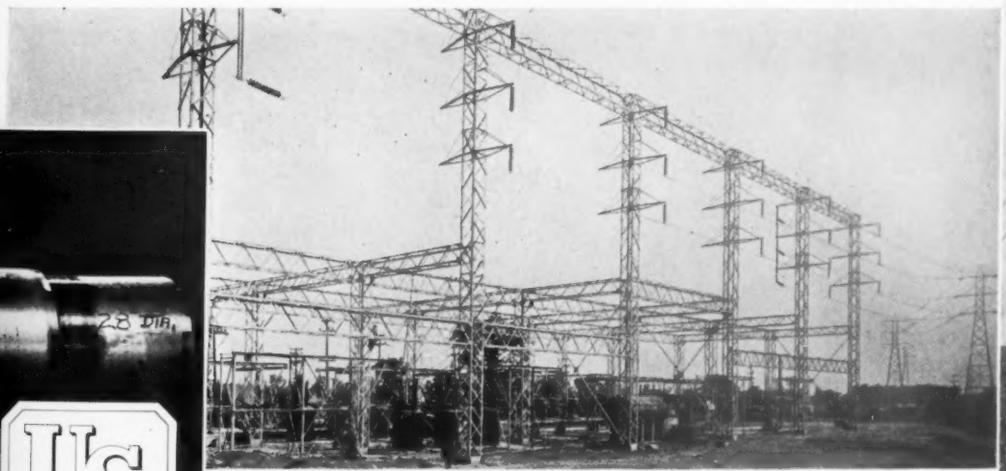
R to You . . . with the Aid of Steel

STEEL skeletons support the buildings that house the generators at any source of power. Steel conveys water or steam to steel machinery which, in turn, drives mammoth generators—with housings, armatures, shafts and other vital parts of steel.

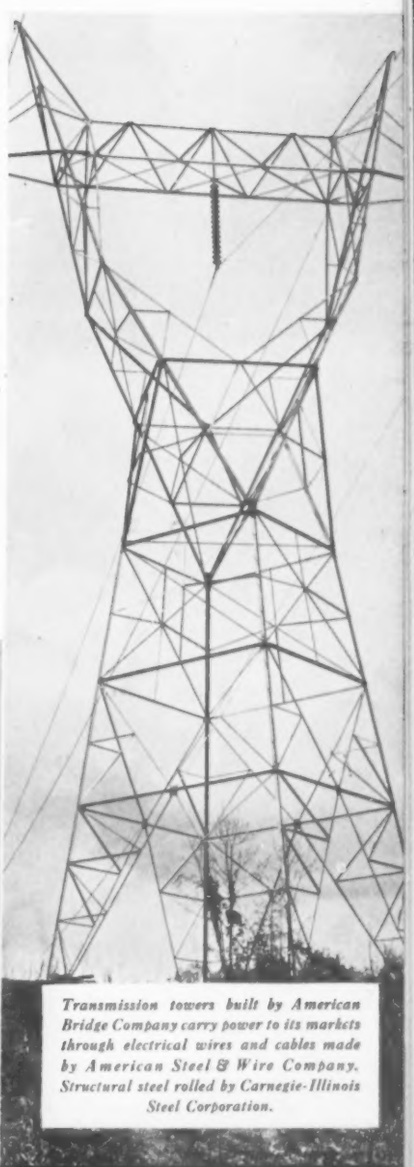
The resulting high potential load strides out across states on copper wires strung high on towers of steel, to enter substations which are networks of steel. Here in transformers cased in steel, the potential is reduced to a point suitable to pass through the congested streets of modern cities, borne on steel poles or in steel conduit.

We find steel and electricity, two vigorous industries, stepping along together. Each is vital to the other.

AMERICAN BRIDGE COMPANY, *Pittsburgh*
AMERICAN STEEL & WIRE COMPANY, *Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Products Company, New York, *Export Distributors*



(Above) *Substations transform power into more usable voltages. They are fabricated and erected by American Bridge Company, and use wire of many kinds made by American Steel & Wire Company. Steel rolled by Carnegie-Illinois Steel Corporation*



Transmission towers built by American Bridge Company carry power to its markets through electrical wires and cables made by American Steel & Wire Company. Structural steel rolled by Carnegie-Illinois Steel Corporation.

US STEEL

UNITED STATES STEEL

As VARIED as the needs,

are the steels we make for the Electrical Industry

WE are proud of our close association with the electrical industry—that our products have helped speed its progress—and that, whenever new developments arrived in electrical manufacture, we were ready with steels to make them practical.

When electrical manufacturers asked for corrosion resistance, stainless steels filled the need. When the industry called for greater strengths, greater resistance to wear, greater permeability—specialized steels were ready to handle the problem.

Whether these needs were for huge motor housings or cold rolled strip steel for household appliances, whether for heavy elevator cables or stamping sheets for refrigerators, the demand was met ably and well.

As the last few years have seen the greatest strides in the use of specialized steels by the electrical industry, the immediate future is even more promising. Hence, we are constantly engaged in research to be in position to help the electrical industry advance still more rapidly.

AMERICAN STEEL & WIRE COMPANY, *Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*

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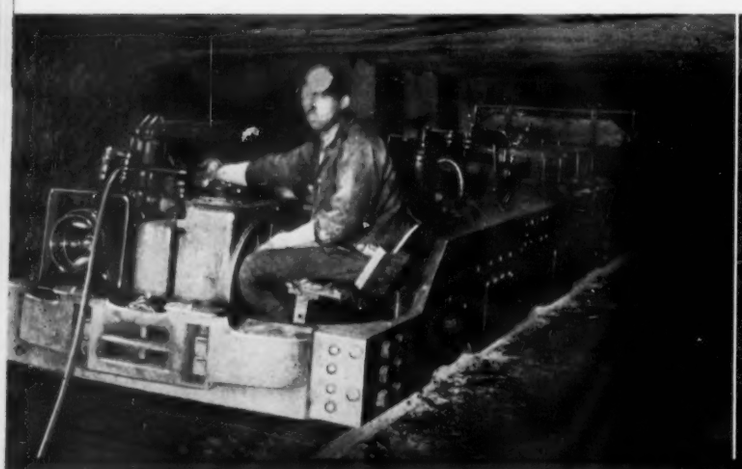
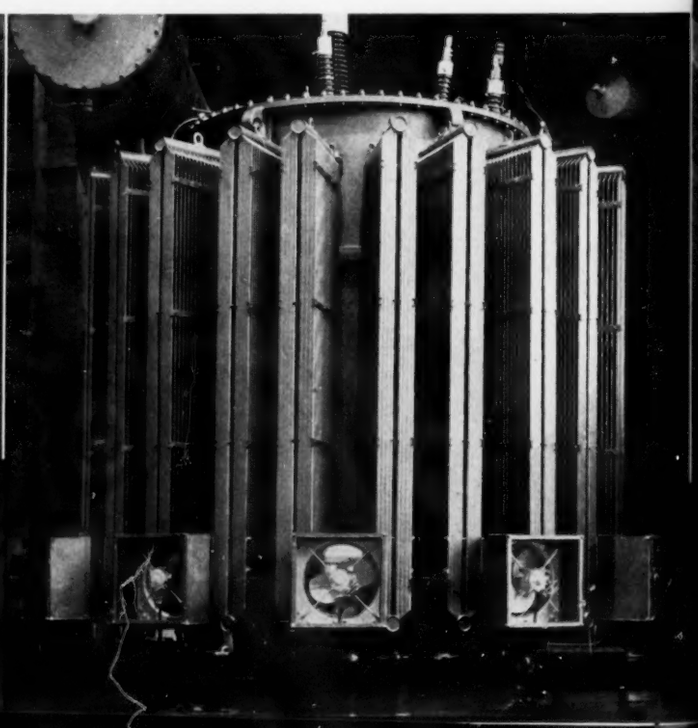
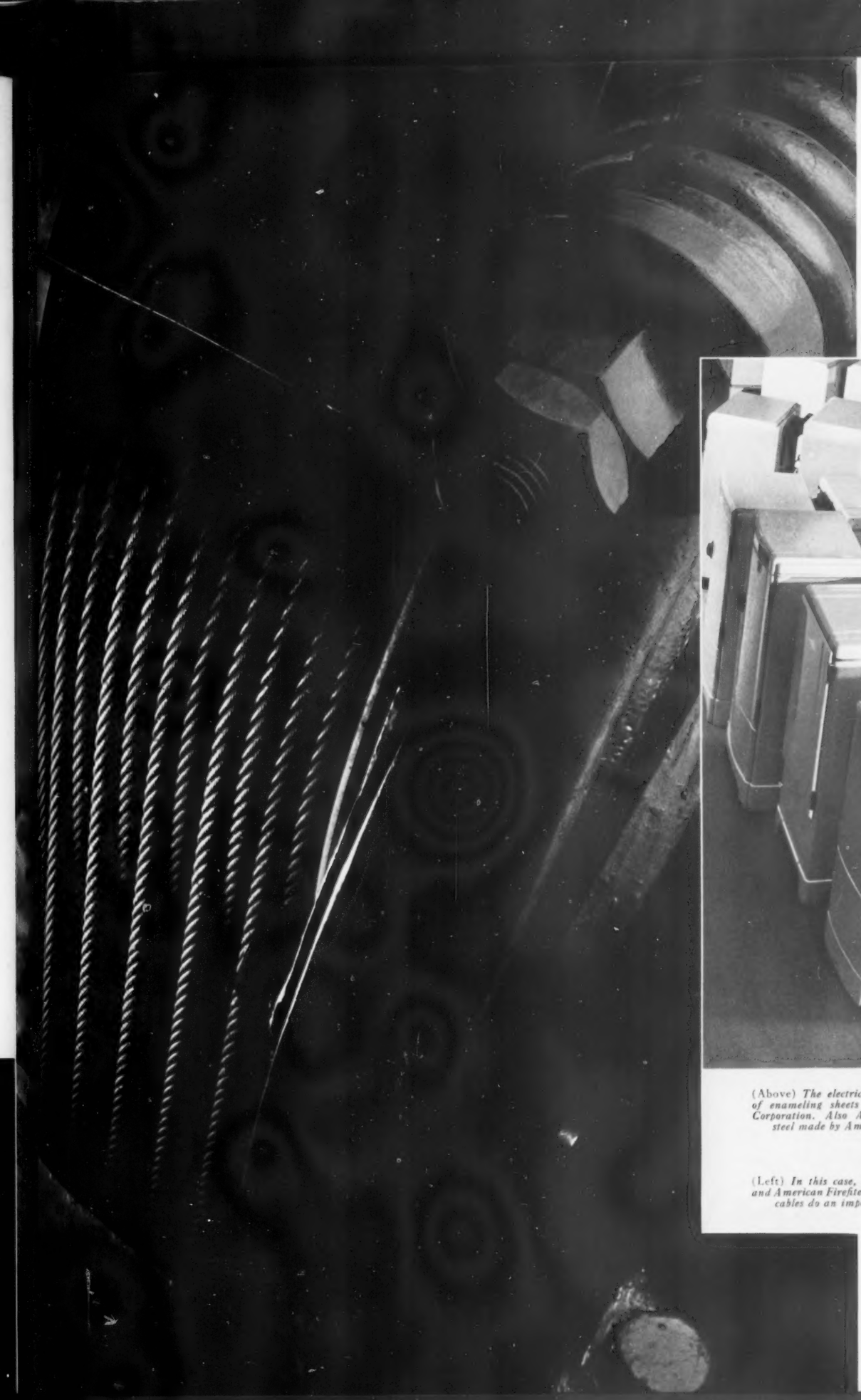
United States Steel Products Company, New York, *Export Distributors*

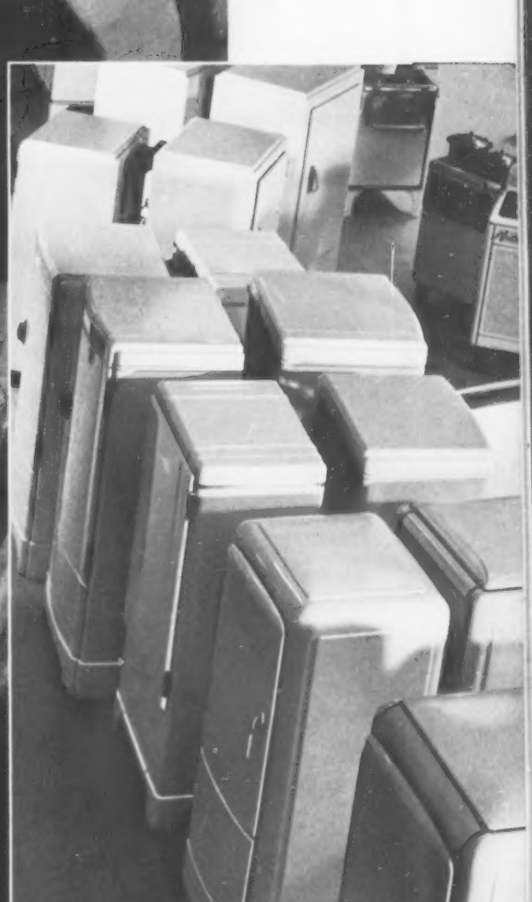


(Above) *Wherever you go you will find American Steel & Wire Company electrical wires and cables bringing power to electrical equipment.*



(Right) *The heart of much electrical equipment is made of Carnegie-Illinois Steel Corporation's electrical sheets and rolled shapes. Much American Steel & Wire Company magnet wire is used for equipment of this kind.*



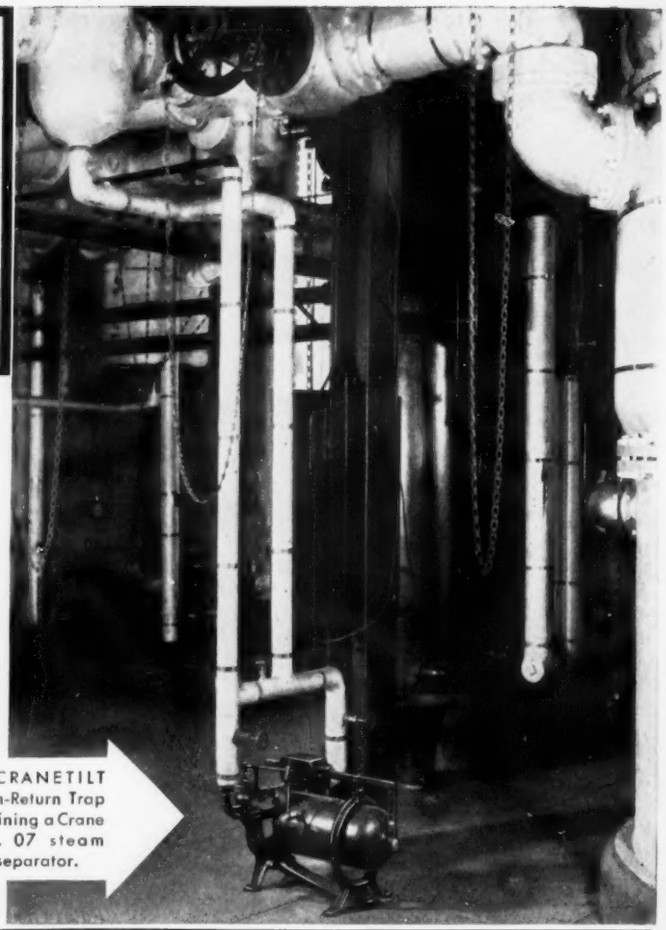


(Above) *The electrical industry uses thousands of tons of enameling sheets rolled by Carnegie-Illinois Steel Corporation. Also American Quality cold rolled strip steel made by American Steel & Wire Company.*

(Left) *In this case, American Tiger Brand Wire Rope and American Firefite elevator lighting, control and signal cables do an important job on electric elevators.*

UNITED STATES STEEL

Capacity DURABILITY *Versatility*



A CRANETILT Non-Return Trap draining a Crane No. 07 steam separator.

• The CRANETILT Trap is a real power-plant trap. It has unusually large capacity for given size pipe connections, great dependability and long life. It is simple and rugged in construction with all important parts outside the tank where they can be readily inspected.

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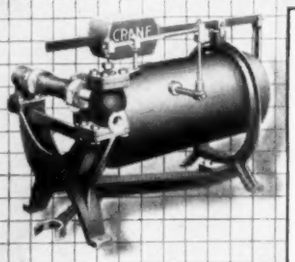

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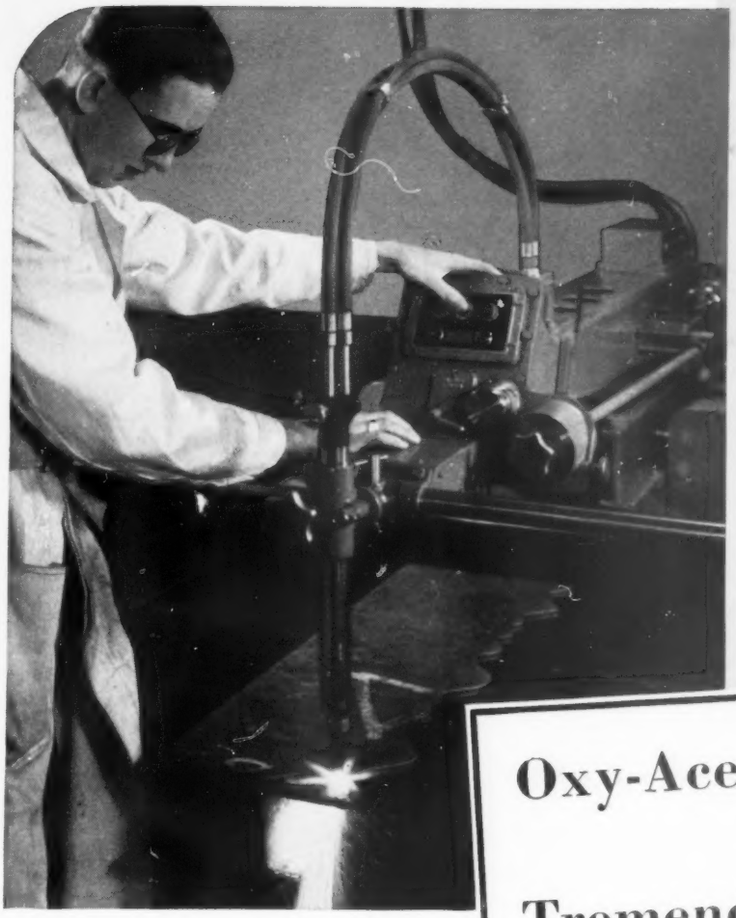

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A Linde representative will be glad to give you complete information about the new CM-12 and to help you adapt oxy-acetylene cutting to your specific steel-shaping requirements. Linde offices are located in principal cities throughout the country. Address the Linde office in your city or The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y.

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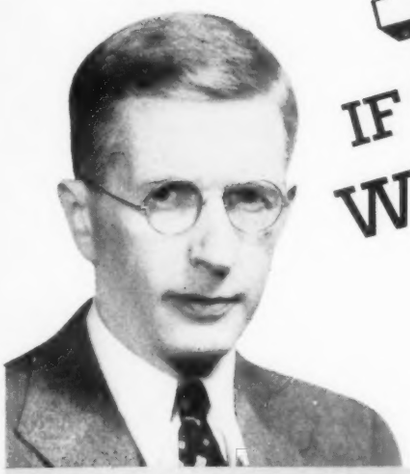

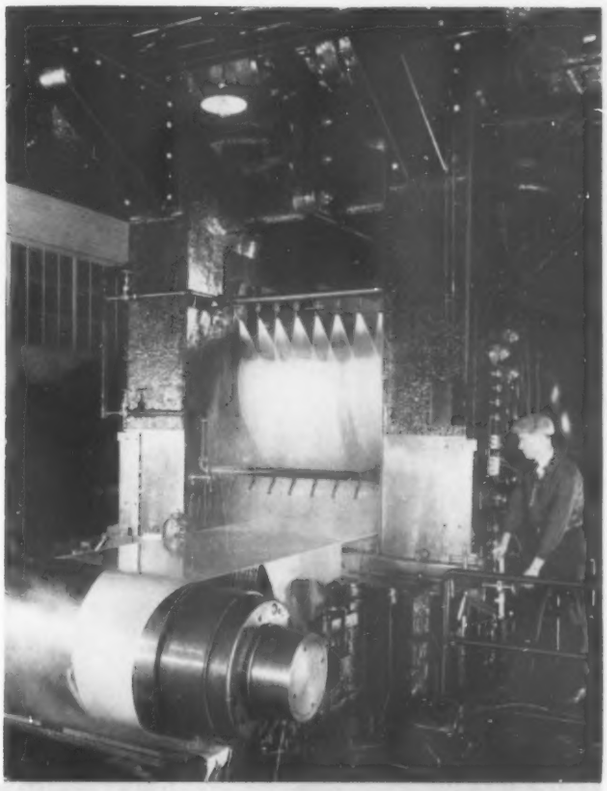

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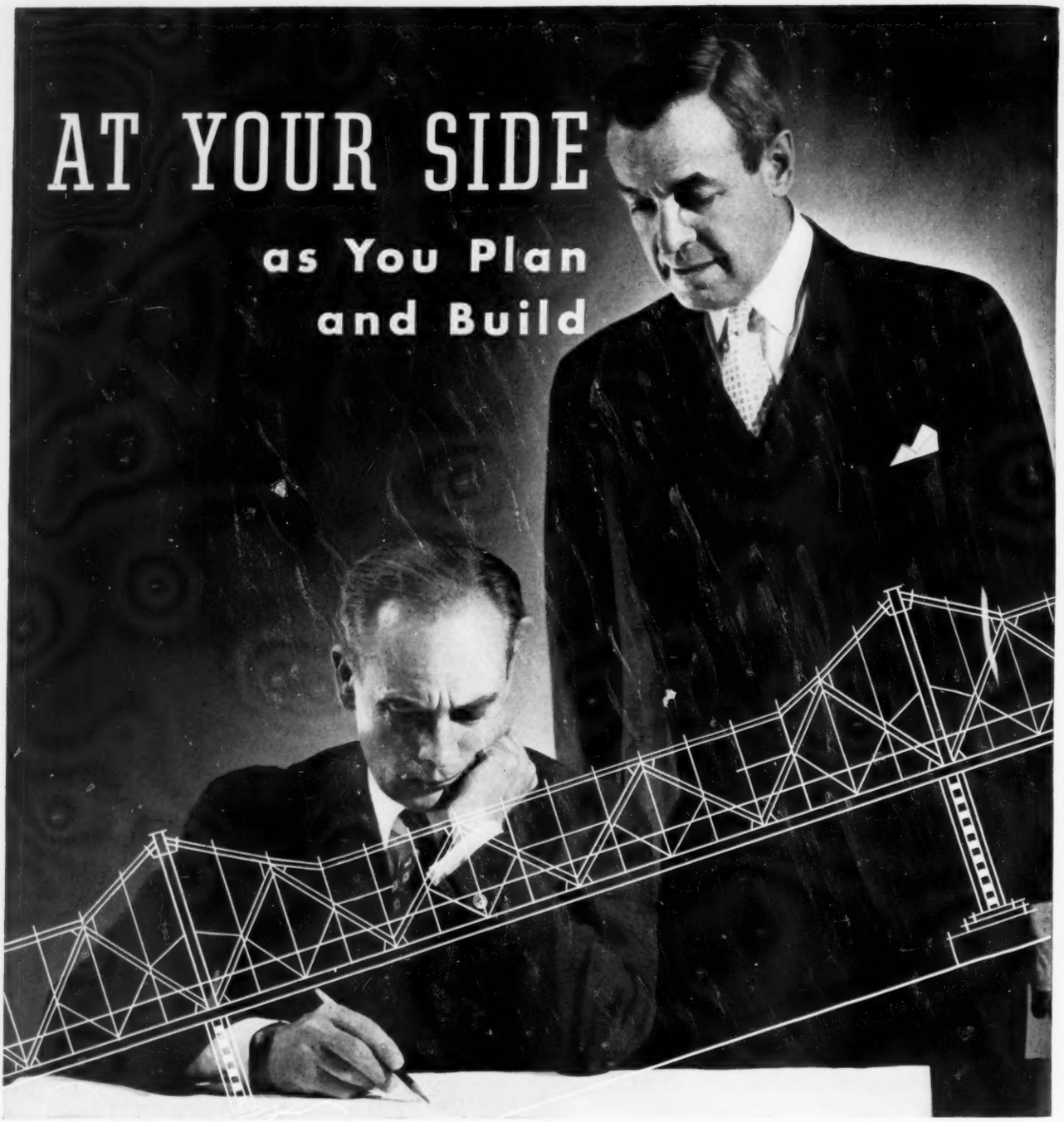

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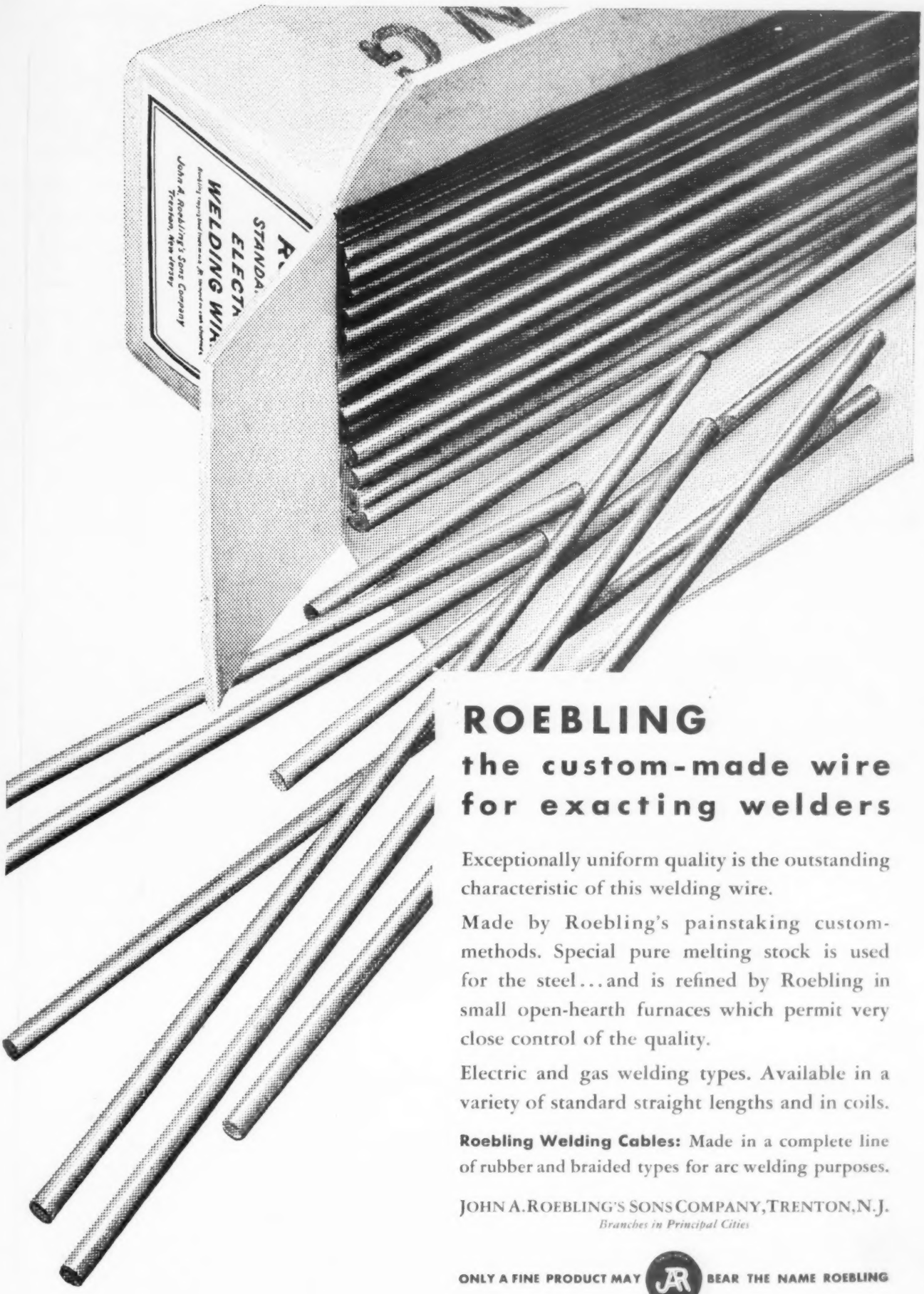

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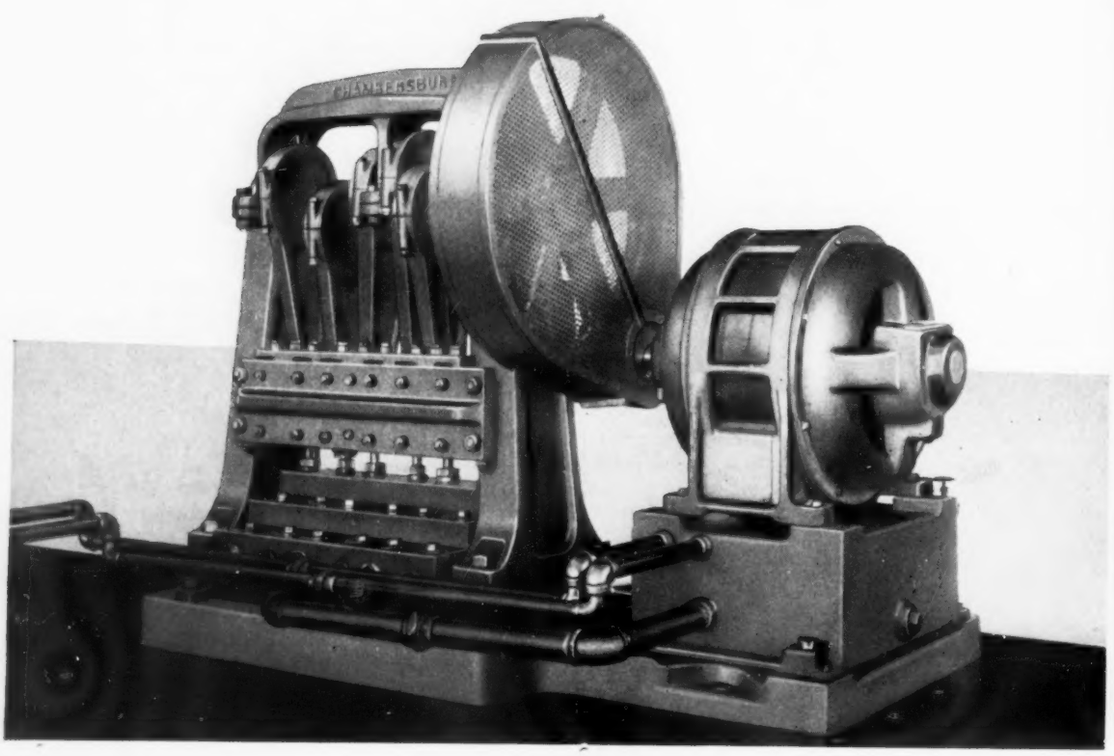

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FOR SALE

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NORTH WALES MACHINE CO. INC., NORTH Wales. Grey Iron, Nickel, Chrome, Molybdenum Alloys. Semi-steel. Superior quality machine and hand molded, sand blast and tumbled.

Stampings

MICHIGAN

LANSING STAMPING CO., 1171 Penn Ave., Lansing. Heavy, medium and light metal stampings. Send blue prints or samples for estimate.

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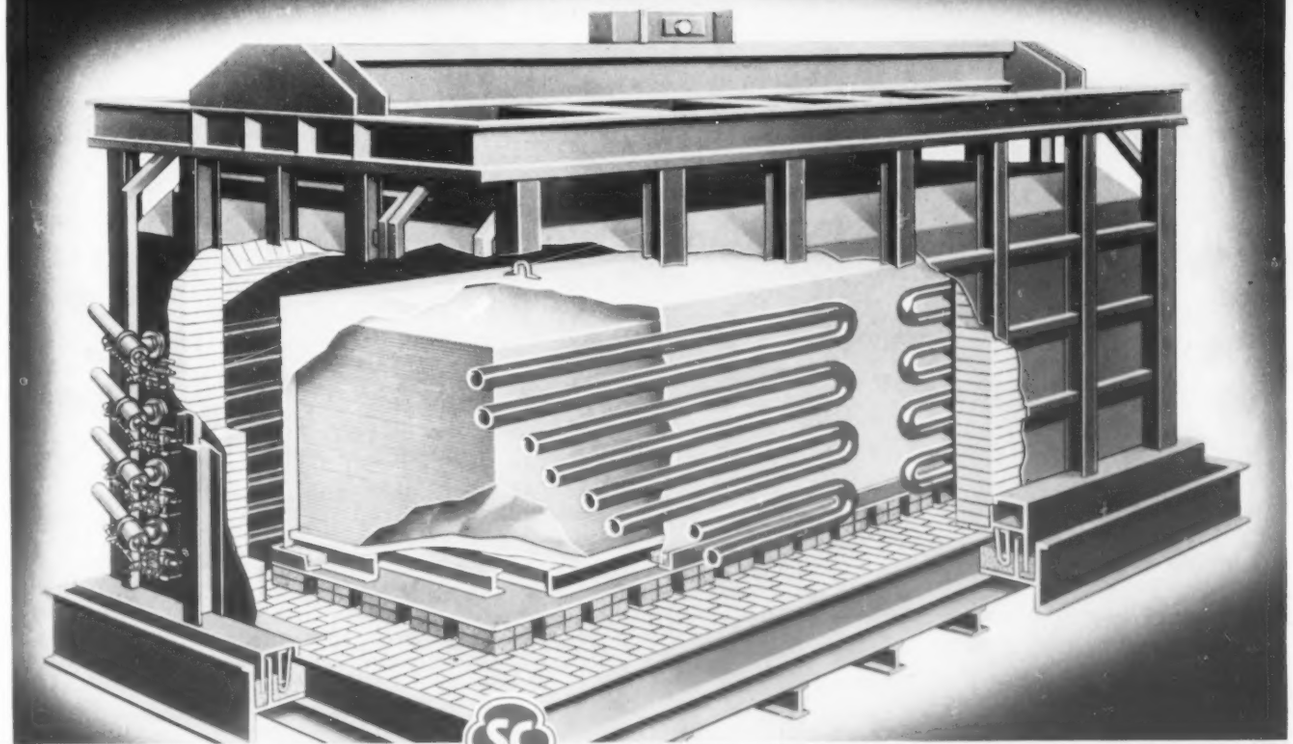

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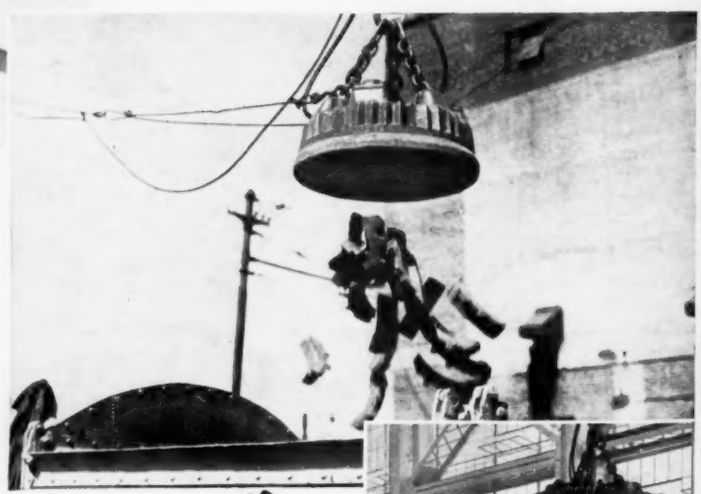

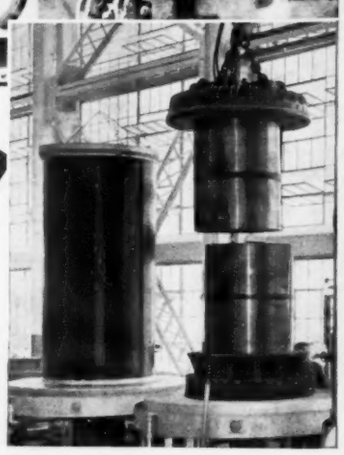

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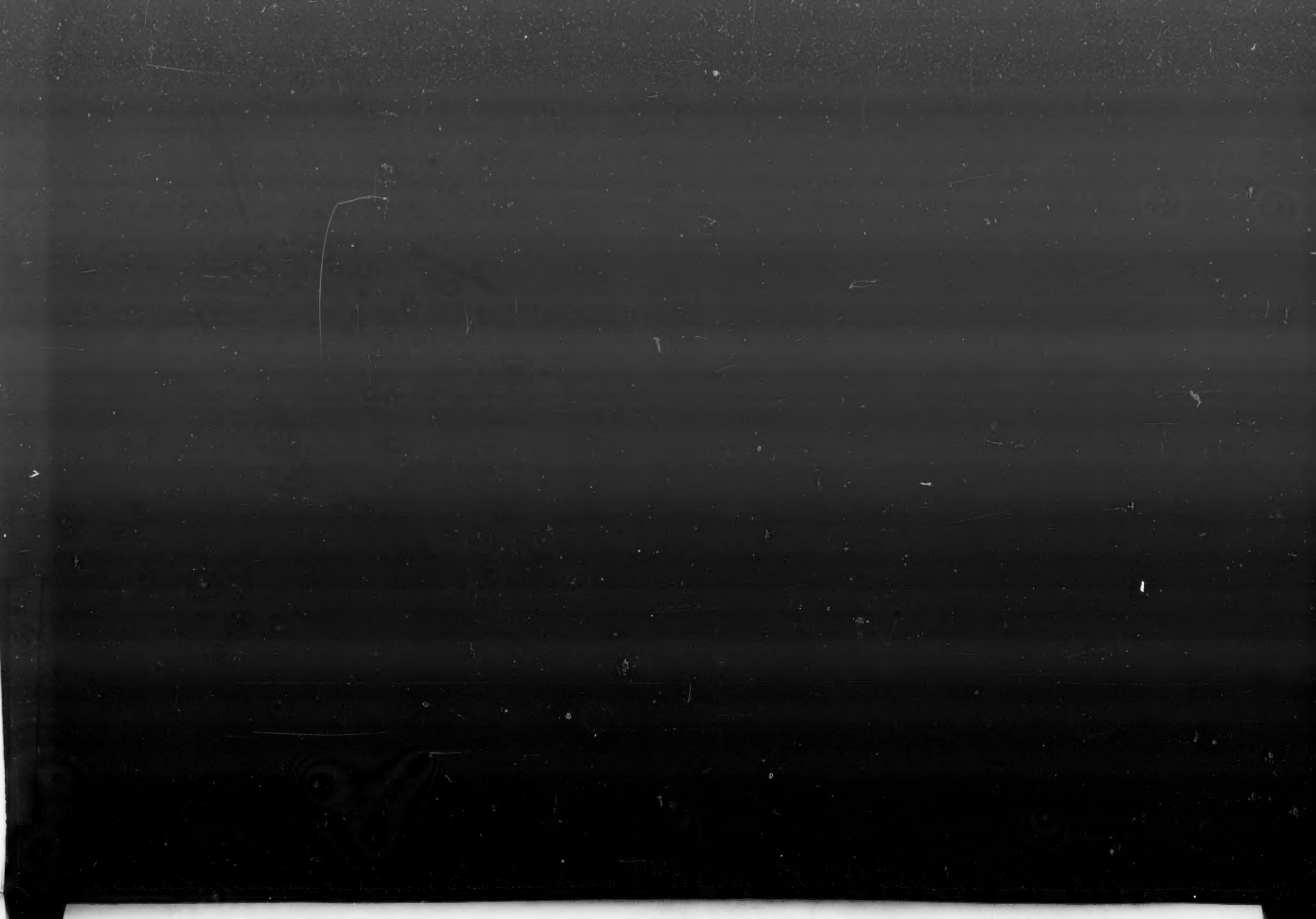
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